COMMERZBANK

Disclosure Report 2016

Disclosure in accordance with the Capital Requirements Regulation as at 31 December 2016

The bank at your side

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Due to rounding, numbers and percentages presented throughout this report may not add up precisely to the totals provided.

Introduction

Commerzbank

Commerzbank is leading international commercial bank with branches and offices in almost 50 countries. With approximately 1,000 branches Commerzbank has one of the densest branch networks among German private banks. Commerzbank serves more than 17.5 million private and small business customers and more than 60,000 corporate clients, multinationals, financial service providers, and institutional clients.

As part of its new strategy, Commerzbank is focusing its business activities on the two core segments "Private and Small-Business Customers" and "Corporate Clients", hereby offering a comprehensive portfolio of banking and capital market services. The run-off segment Asset & Capital Recovery (ACR) comprises – besides the Public Finance business – all non-strategic activities of commercial real estate and ship financing. Each segment is managed by a member of the Board of Managing Directors.

All staff and management functions are contained in Group Management: Group Audit, Group Communications, Group Compliance, Group Development & Strategy, Group Finance, Group Human Resources, Group Investor Relations, Group Legal, Group Treasury and the central risk functions. The support functions are provided by Group Services. These include Group Banking Operations, Group Markets Operations, Group Information Technology, Group Organisation & Security and Group Delivery Center. The staff, management and support functions are combined in the Others and Consolidation division.

On the domestic market, Commerzbank Aktiengesellschaft is headquartered in Frankfurt am Main, from where it manages a nationwide branch network through which all customer groups are served. The most important domestic subsidiaries are comdirect bank AG and Commerz Real AG. Outside Germany, the Bank has 6 material subsidiaries, 23 operational foreign branches and 34 representative offices in more than 50 countries and is represented in all major financial centres, such as London, New York, Tokyo, Hong Kong and Singapore. However, the focus of the international activities is on Europe.

A detailed description of Commerzbank Group is given in the Annual Report 2016. Information regarding the remuneration system of Commerzbank is laid down in the Remuneration Report 2016 (according to the German Remuneration Ordinance for Institutions) as well as in the section Remuneration Report in the Annual Report 2016.

Objective of the Disclosure Report

This report is intended to give the reader a detailed insight into Commerzbank's current risk profile and risk management. In particular, it contains information on:

- the Commerzbank Group's structure from both a regulatory and accounting perspective,
- the Group's capital structure,
- the Commerzbank Group's general risk management system and
- the risk management in respect of specific types of risk.

The report may also be seen as complementary to the Annual Report pursuant to the German Commercial Code (Handelsgesetzbuch – HGB), since in contrast to the Annual Report it focuses primarily on the supervisory perspective.

In this report Commerzbank Aktiengesellschaft as the ultimate parent company of the regulated banking group is complying with the disclosure requirements of Article 431 – 455 of the regulation (EU) No. 575/2013 – Capital Requirements Regulation (CRR) as at the reporting date 31 December 2016.

An overview of the structure of risk reporting in the Annual Report and Disclosure Report 2016 may be found in table 55 in the appendix to this document.

Scope

This Disclosure Report is based on the group of companies consolidated for regulatory purposes. The companies consolidated for regulatory purposes only include those carrying out banking and other financial business. The consolidated group consists of a domestic parent company and its affiliated companies. The aim of regulatory consolidation is to prevent multiple use of capital that in fact exists only once by subsidiary companies in the financial sector. The companies consolidated under IFRS, by contrast, comprise all the companies controlled by the ultimate parent company.

In accordance with the materiality principle set out in Article 432 (1) CRR, this disclosure relates to the largest entities within the Commerzbank Group. This enables the focus to be placed on the information that is most material. Subsidiaries classified as material during the annual risk inventory are included in the Disclosure Report according to a uniform definition of materiality throughout the Group. In addition, at least 95% coverage of the capital adequacy requirements of the entire Commerzbank Group must be achieved with these companies. This applies for default risks and also for market and operational risks. If this is not the case, other subsidiaries will be brought into the group of consolidated companies. A check is carried out in the run-up to the annual Disclosure Report to determine whether or not the 95% ratio is complied with for all risk types. An adjustment to the group of consolidated companies would be implemented as at 31 December, if applicable, and remains unchanged for the upcoming three quarterly reports.

In accordance with this definition, the following companies – as in last year's report – are included in the Disclosure Report 2016 alongside Commerzbank Aktiengesellschaft:

- mBank S.A.,
- comdirect bank AG,
- Commerz Real AG,
- Commerzbank Finance & Covered Bond S.A. (CFCB) and
- Loan Solutions Frankfurt GmbH (LSF).

These six companies account for over 95% of the Commerzbank Group's total capital adequacy requirement. The 95% condition is also met in each case for the individual types of risk.

The information in this Disclosure Report generally relates to the six consolidated entities listed above. Where this is not the case – e.g. with regard to the capital structure – it is explicitly stated. All entities are fully consolidated both from a supervisory perspective and in accordance with IFRS.

In the context of the disclosure requirements (Article 431 (3) CRR), besides the Disclosure Report itself, all policies and processes have to be documented as a main component to fulfil the Pillar 3 requirements of the Basel framework. The appropriateness and practicality of the Bank's disclosure practice has to be reviewed on a regular basis. For this purpose, Commerzbank has defined guidelines for the Disclosure Report which regulate the overarching, strategic part of the instructions. The operative targets and responsibilities are additionally defined in separate documents.

With consolidated total assets that are regularly well in excess of €30bn, Commerzbank is one of the biggest financial institutions in Germany. Hence, independent of the criteria in Article 433 CRR, Commerzbank has implemented the reporting requirements during the period from Q2 2015 on and discloses the quarterly and semi-annually required information as appropriate.[1]

Waiver rule pursuant to Article 7 CRR

Under the waiver rule pursuant to Article 7 CRR in conjunction with section 2a (1) of the German Banking Act (KWG), subsidiary companies in a banking group may apply for exemption from the requirements of Article 6 (1) CRR (on capital, large exposures, exposures to transferred credit risk and disclosure) at single entity level. This is on condition, among other things, that both the parent company and subsidiary are licensed in the same member state and the subsidiary is included in the supervision on a consolidated basis of the parent company.

Exemption is also on condition that there is no current or foreseen material practical or legal impediment to the prompt transfer of own funds or the repayment of liabilities by the parent company, that the parent company guarantees the commitments entered into by the subsidiary, the risk evaluation, measurement and control procedures of the parent company cover the subsidiary, and the parent company holds more than 50% of the voting rights in the subsidiary or can appoint or remove a majority of the members of the management body and can therefore exercise a dominant influence over the subsidiary.[2]

In the case of institutions and parent companies that were already making use of a waiver before the CRR came into effect under the rules of the German Banking Act (KWG) applicable at the time, using the disclosure procedure then specified, exemption is deemed to have been granted under Article 7 CRR and the relevant standards under section 25a (1) sentence 3 KWG (see section 2a (5) KWG).

The waiver rule is used by comdirect bank AG. It is – for instance by virtue of the risk management carried out at Group level (in line with MaRisk) – fully integrated into the internal processes and risk management of Commerzbank Aktiengesellschaft as the ultimate parent company of the banking group. This applies in particular to the methods used, risk management, monitoring of operations, management and reporting. Commerzbank Aktiengesellschaft holds 81.3% of the voting rights in comdirect bank AG and guarantees its commitments towards third parties (through letters of comfort).

According to Article 7 CRR in conjunction with section 2a (1) KWG, parent companies within the group of companies consolidated for regulatory purposes are also entitled to this exemption. The opportunity this offers for Commerzbank Aktiengesellschaft as the ultimate parent company of the Commerzbank Group to be exempted from the requirements at single entity level has been utilised since 2007. The conditions for claiming the waiver continue to apply.

Utilisation of the waiver rule was reported at the outset to BaFin and the Bundesbank with evidence of compliance with the requirements and is subsequently monitored and documented on occasion.

[1] For this see EBA/GL/2014/14, title V (18).
[2] Under Article 7 (1) d) CRR, a dominant influence means either having a majority of voting rights or having the right to appoint a majority of the members of the management body of the subsidiary.

Equity capital

Capital structure

The main rules governing compliance with minimum regulatory capital ratios for solvency purposes in the EU are contained in the Capital Requirements Directive (CRD) IV, the Capital Requirements Regulation (CRR), a European regulation which, unlike the CRD IV Directive, has direct legal effect for all European banks, together with the SSM Regulation (Council Regulation No. 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions). This legislation is supplemented at national level in Germany by further provisions in the German Banking Act, the German Solvency Regulation and other regulations. In addition, Implementing Technical Standards (ITS) and Regulatory Technical Standards (RTS) provide explanations about particularly complex matters. The introduction of the new regulations in 2014 has strengthened the quality of regulatory capital compared with the previous regime, made capital requirements more stringent and set higher minimum requirements for banks' capital adequacy.

To avoid having the requirements take effect on a single date, certain parts of the new rules are subject to defined phase-in rules.

Common Equity Tier 1 (CET1) capital consists largely of subscribed capital plus reserves and non-controlling interests. Adjustments to this figure may be necessitated by any number of causes, for example goodwill, intangible assets, write-downs of assets (if assets are not valued cautiously enough in the regulator's view), shortfalls due to the comparison of expected losses with the provisions recognised for them and the correction of tax loss carry-forwards. Adding Additional Tier 1 capital (AT1), which can contain subordinated debt instruments with certain conditions, produces Tier 1 capital. Tier 2 capital consists largely of subordinated debt instruments which are not eligible as Additional Tier 1 capital. The eligibility of these capital components has been reduced, as over the final five years of their life they may now only be amortised on a straight-line basis.

Commerzbank seeks to achieve the following objectives in managing its capital:

- adherence to the statutory minimum capital requirements at Group level and in all companies included in the regulatory Group,
- ensuring that the planned capital ratios are met, including the new ECB/EBA requirements,
- provision of sufficient reserves to guarantee the Bank's freedom of action at all times,
- strategic allocation of Tier 1 capital to business segments and divisions in order to exploit growth opportunities.

The financial crisis made the importance of adequate CET1 capital levels for banks become an issue of increasing public concern. At Commerzbank, Tier 1 capital has always been a key management target. The Bank's specifications for the capital ratios far exceed the minimum statutory requirements. The Bank's risk-bearing capacity and market expectations play an important role in determining the internal capital ratio targets. For this reason, Commerzbank has stipulated minimum ratios for regulatory capital. CET1 capital is allocated via a regular process that takes account of the Bank's strategic direction, profitable new business opportunities in the core business of each business segment as well as aspects of risk-bearing capacity.

Measures relating to the Bank's capital are approved by the Board of Managing Directors, subject to the authorisation granted by the annual general meeting. During the past year, Commerzbank met the minimum statutory capital requirements as well as the requirements of the ECB and EBA at all times. All of the proposed new regulations are still subject to change. Parts of the proposed ITS and RTS are still outstanding. Consequently, all figures for risk-weighted assets, capital and capital ratios reflect Commerzbank's current understanding of the applicable regulations. In the pro forma calculation of fully phased-in implementation of the CRR requirements, the transitional regulations are completely disregarded.

To provide a comprehensive overview of the Group's available equity, the analyses shown in tables 1 to 4 comprise the complete group of companies consolidated for regulatory purposes. This equity capital is the basis for the calculation of the equity capital adequacy as reported to the Bundesbank.

Details of the issued capital instruments of the Commerzbank Group according to Article 437 (1) b) and c) CRR are given on the Commerzbank website in the section Debt holder information/Capital instruments. Further information on our leverage ratio according to Article 451 CRR is given in Note 90 (Capital requirements and leverage ratio) in the Annual Report 2016, which is published on our website.

The composition of the regulatory equity capital and the equity capital ratios are shown in the following table:

Table 1: Equity structure

Line		A: Amount on the day of disclosure	C: Residual amount[1]
Common Equity Tier 1 capital: instruments and reserves			
1	Capital instruments and the related share premium accounts	18,444	0
1a	thereof: subscribed capital	1,252	
1b	thereof capital reserve	17,192	
2	Retained earnings	10,795	
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	–1,014	see line 26a
3a	Funds for general banking risk	0	
4	Amount of qualifying items referred to in Art. 484 (3) and the related share premium accounts subject to phase out from CET1	0	
4a	Public sector capital injections grandfathered until 1 January 2018	0	
5	Minority interests (amount allowed in consolidated CET1)	759	–168
5a	Independently reviewed interim profits net of any foreseeable charge or dividend	213	
6	**Common Equity Tier 1 (CET1) capital before regulatory adjustments**	**29,198**	
Common Equity Tier 1 (CET1) capital: regulatory adjustments			
7	Additional value adjustments (negative amount)	–367	
8	Intangible assets (net of related tax liability) (negative amount)	–1,733	–969
10	Deferred tax assets subject to future profit ratio excluding those arising from temporary differences (net of related tax liability where the conditions in Art. 38 (3) are met) (negative amount)	–297	–198
11	Fair value reserves related to gains or losses on cash flow hedges	97	
12	Negative amounts resulting from the calculation of expected loss amounts	–326	–199
13	Any increase in equity that results from securitised assets (negative amount)	0	
14	Gains or losses on liabilities valued at fair value resulting from changes in own credit standing	–240	–118
15	Defined benefit pension fund assets (negative amount)	–231	–154
16	Direct and indirect holdings by an institution of own CET1 instruments (negative amount)	–31	–20
17	Holdings of the CET1 instruments of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount)	0	0
18	Direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0	0
19	Direct, indirect and synthetic holdings by the institution of the CET1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0	0
20a	Exposure amount of the following items which qualify for a RW of 1250%, where the institution opts for the deduction alternative	–302	
20b	thereof: qualifying holdings outside the financial sector (negative amount)	0	
20c	thereof: securitisation positions (negative amount)	–301	
20d	thereof: free deliveries (negative amount)	–1	
21	Deferred tax assets subject to future profit ratio and arising from temporary differences (amount above 10% threshold, net of related tax liability where the conditions in Art. 38 (3) are met) (negative amount)	–166	–111
22	Amount exceeding the 15% threshold (negative amount)	0	0
23	thereof: direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution has a significant investment in those entities	0	0
25	thereof: deferred tax assets subject to future profit ratio and arising from temporary differences	0	0

Line		A: Amount on the day of disclosure	C: Residual amount[1]
25a	Losses for the current financial year (negative amount)	0	0
25b	Foreseeable tax charges relating to CET1 items (negative amount)	0	0
26	Regulatory adjustments applied to CET1 in respect of amounts subject to pre-CRR treatment	891	
26a	thereof: regulatory adjustments relating to unrealised profit and losses according to Art. 467 and 468	891	
26a.1	thereof: unrealised losses from risk positions to sovereigns in the category "available for sale" of the international accounting standard IAS39 adopted by the Union	0	
26a.2	thereof: unrealised profits from risk positions to sovereigns in the category "available for sale" of the international accounting standard IAS39 adopted by the Union	0	
26b	Amount to be deducted from or added to CET1 with regard to additional deduction or correction positions and deductions required pre CRR	0	
27	Qualifying AT1 deductions that exceed the AT1 capital of the institution (negative amount)	0	
27a	Other CET1 capital elements or deductions	0	
28	**Total regulatory adjustments to Common Equity Tier 1 (CET1) capital**	**–2,704**	
29	**CET1 capital**	**26,494**	
Additional Tier 1 (AT1) capital: instruments			
30	Capital instruments and the related share premium accounts	0	
31	thereof: classified as equity under applicable accounting standards	0	
32	thereof: classified as liabilities under applicable accounting standards	0	
33	Amount of qualifying items referred to in Art. 484 (4) and the related share premium accounts subject to phase out from AT1	1,066	
33a	Public sector capital injections grandfathered until 1 January 2018	0	
34	Qualifying Tier 1 capital included in consolidated AT1 capital (including minority interests not included in line 5) issued by subsidiaries and held by third parties	0	0
35	thereof: instruments issued by subsidiaries subject to phase out	0	
36	**Additional Tier 1 (AT1) capital before regulatory adjustments**	**1,066**	
Additional Tier 1 (AT1) capital; regulatory adjustments			
37	Direct and indirect holdings by an institution of own AT1 instruments (negative amount)	0	0
38	Holdings of the AT1 instruments of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount)	0	0
39	Direct and indirect holdings of the AT1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0	0
40	Direct and indirect holdings by the institution of the AT1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0	0
41	Regulatory adjustments applied to AT1 capital in respect of amounts subject to pre-CRR treatment and transitional treatments subject to phase-out as prescribed in the CRR (i.e. CRR residual amounts)	–1,066	
41a	Residual amounts deducted from AT1 capital with regard to deduction from CET1 capital during the transitional period pursuant to Art. 472 CRR	–1,066	
41a.1	thereof: losses of the current financial year (net)	0	
41a.2	thereof: intangibles	–969	
41a.3	thereof: shortfall of provisions to expected losses	–94	
41a.4	thereof: direct holdings of own CET1 instruments	–3	
41a.5	thereof: reciprocal cross holdings	0	

Line		A: Amount on the day of disclosure	C: Residual amount[1]
41a.6	thereof: equity capital instruments of financial sector entities where the institution does not have a significant investment in those entities	0	
41a.7	thereof: equity capital instruments of financial sector entities where the institution has a significant investment in those entities	0	
41b	Residual amounts deducted from AT1 capital with regard to deductions from Tier 2 capital during the transitional period pursuant to Art. 475 CRR	0	
41b.1	thereof: reciprocal cross holdings of Tier 2 instruments	0	
41b.2	thereof: direct positions of non-significant capital holdings of other financial sector entities	0	
41c	Amount to be deducted from or added to AT1 capital with regard to additional deduction or correction positions and deductions required pre CRR	0	
41c.1	thereof: possible deduction or correction positions for unrealised losses	0	
41c.2	thereof: possible deduction or correction positions for unrealised profits	0	
41c.3	thereof: others	0	
42	Qualifying Tier 2 deductions that exceed the Tier 2 capital of the institution (negative amount)	0	
42a	Other AT1 capital elements or deductions	0	
43	**Total regulatory adjustments to Additional Tier 1 (AT1) capital**	**–1,066**	
44	**Additional Tier 1 (AT1) capital**	**0**	
45	**Tier 1 capital (T1 = CET1 + AT1)**	**26,494**	
Tier 2 capital: instruments and provisions			
46	Capital instruments and the related share premium accounts	5,495	
47	Amount of qualifying items referred to in Art. 484 (5) and the related share premium accounts subject to phase out from Tier 2	84	
47a	Public sector capital injections grandfathered until 1 January 2018	0	
48	Qualifying own funds instruments included in consolidated Tier 2 capital (including minority interests and AT1 instruments not included in rows 5 or 34) issued by subsidiaries and held by third parties	284	–7
49	thereof: instruments issued by subsidiaries subject to phase out	7	
50	Credit risk adjustments	0	
51	**Tier 2 capital before regulatory adjustments**	**5,862**	
Tier 2 capital: regulatory adjustments			
52	Direct and indirect holdings by an institution of own Tier 2 instruments and subordinated loans (negative amount)	–80	0
53	Holdings of the Tier 2 instruments and subordinated loans of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount)	0	0
54	Direct and indirect holdings of the Tier 2 instruments and subordinated loans of financial sector entities where the institution does not have a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0	0
54a	thereof: new holdings not subject to transitional arrangements	0	0
54b	thereof: holdings existing before 1 January 2013 and subject to transitional arrangements	0	0
55	Direct and indirect holdings of the Tier 2 instruments and subordinated loans of financial sector entities where the institution has a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0	0
56	Regulatory adjustments applied to Tier 2 in respect of amounts subject to pre-CRR treatment and transitional treatments subject to phase-out as prescribed in the CRR (i.e. CRR residual amounts)	–105	
56a	Residual amounts deducted from Tier 2 capital with regard to deduction from Common Equity Tier1 capital during the transitional period pursuant to Art. 472 of the CRR	–105	
56a.1	thereof: shortfall of provisions to expected losses	–105	

Line		A: Amount on the day of disclosure	C: Residual amount[1]
56a.2	thereof: CET1 instruments of financial sector entities where the institution does not have a significant investment in those entities	0	
56a.3	thereof: CET1 instruments of financial sector entities where the institution has a significant investment in those entities	0	
56b	Residual amount deducted from Tier 2 capital with regard to deduction from AT1 capital during the transitional period pursuant to Art. 475 CRR	0	
56b.1	thereof: AT1 capital of financial sector entities where the institution does not have a significant investment in those entities	0	
56b.2	thereof: AT1 capital of financial sector entities where the institution has a significant investment in those entities	0	
56c	Amount to be deducted from or added to Tier 2 capital with regard to additional deduction or correction positions and deductions required pre CRR	0	
56c.1	thereof: possible deduction or correction positions for unrealised losses	0	
56c.2	thereof: possible deduction or correction positions for unrealised profits	0	
56d	Other Tier 2 capital elements or deductions	0	
57	**Total regulatory adjustments to Tier 2 capital**	**–185**	
58	**Tier 2 capital**	**5,677**	
59	**Total capital (TC = Tier 1 + Tier 2)**	**32,171**	
59a	Risk-weighted assets in respect of amounts subject to pre-CRR treatment and transitional treatments subject to phase-out as prescribed in CRR (i.e. CRR residual amounts)	326	
59a.1	thereof: items not to be deducted from CET1 (CRR residual amounts)	215	
59a.1.1	thereof: deferred tax assets subject to future profitability, net of related tax liabilities	198	
59a.1.2	thereof: indirect holdings of own CET1 instruments	17	
59a.1.3	thereof: items not to be deducted from CET1 capital positions (CRR residual amounts)	0	
59a.1.4	thereof: reciprocal cross holdings of CET1 instruments, direct holdings of non-significant investments in the capital of other financial sector entities	0	
59a.2	thereof: items not to be deducted from AT1 capital positions (CRR residual amounts)	0	
59a.2.1	thereof: indirect holdings of own AT1 instruments	0	
59a.2.2	thereof: indirect holdings of non-significant investments in the AT1 capital of other financial sector entities	0	
59a.2.3	thereof: indirect holdings of significant investments in the AT1 capital of other financial sector entities	0	
59a.3	thereof: items not to be deducted from Tier 2 capital positions (CRR residual amounts)	0	
59a.3.1	thereof: indirect holdings of own Tier 2 instruments	0	
59a.3.2	thereof: indirect holdings of non-significant investments in the capital of other financial sector entities	0	
59a.3.3	thereof: indirect holdings of significant investments in the capital of other financial sector entities	0	
60	**Total risk-weighted assets**	**190,527**	

Line		A: Amount on the day of disclosure	C: Residual amount[1]
Capital ratios and buffers			
61	Common Equity Tier 1 (as a percentage of total risk exposure amount)	13.9	
62	Tier 1 (as a percentage of total risk exposure amount)	13.9	
63	Total capital (as a percentage of total risk exposure amount)	16.9	
64	Institution specific buffer requirement (CET1 requirement in accordance with Art. 92 (1) (a) plus capital conservation and countercyclical buffer[2] requirements, plus systemic risk buffer, plus systemically important institution (G-SII or O-SII) buffer expressed as a percentage of risk exposure amount)	5.144	
65	thereof: capital conservation buffer requirement	0.625	
66	thereof: countercyclical buffer requirement	0.011	
67	thereof: systemic risk buffer requirement	0	
67a	thereof: Global Systemically Important Institution (G-SII) or Other Sytemically Important Institution (O-SII) buffer	0	
68	Common Equity Tier 1 available to meet buffers (as a percentage of risk exposure amount)	9.4	
Amounts below the thresholds for deduction (before risk weighting)			
72	Direct and indirect holdings by the institution of capital instruments of financial sector entities where the institution does not have a significant investment in those entities (amount below 10% threshold and net of eligible short positions)	659	
73	Direct and indirect holdings by the institution of the CET1 instruments of relevant financial sector entities where the institution has a significant investment in those entities (amount below 10% threshold and net of eligible short positions)	336	
75	Deferred tax assets subject to future profit ratio, arising from temporary differences (amount below 10% threshold, net of related tax liability where the conditions in Art. 38 (3) are met)	2,666	
Applicable caps on the inclusion of provisions in Tier 2			
76	Credit risk adjustments included in Tier 2 in respect of exposures under the standard approach (before application of cap)	0	
77	Cap on inclusion of credit risk adjustments in Tier 2 under the standardised approach	290	
78	Credit risk adjustments included in Tier 2 in respect of exposures subject to the internal ratings-based approach (before application of cap)	0	
79	Cap on inclusion of credit risk adjustments allowable in Tier 2 related to exposures subject to internal ratings-based approach	714	
Capital instruments subject to phase-out arrangements			
80	Current cap for CET1 instruments subject to phase-out arrangements	0	
81	Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities)	0	
82	Current cap on AT1 instruments subject to phase out arrangements	1,355	
83	Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities)	0	
84	Current cap on Tier 2 instruments subject to phase out arrangements	456	
85	Amount excluded from Tier 2 due to cap (excess over cap after redemptions and maturities)	0	

1 Amounts underlying regulations prior to (EU) No. 575/2013 or mandatory residual amounts according to regulation (EU) No. 575/2013.
2 The geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer is shown in table 50 in the appendix. Table 51 hereof derives the amount of institution-specific countercyclical capital buffer

The reconciliation of the Group's equity reported in the balance sheet with regulatory capital was as follows:

Table 2: Reconciliation of equity as reported in the balance sheet with regulatory capital

Position €m	Equity IFRS (Phase in)[1]	Equity FINREP[2]	Equity COREP[3]
Subscribed capital	1,252	1,252	1,252
Capital reserve	17,192	17,192	17,192
Retained earnings	11,283	11,252	11,252
Silent participations	0	0	0
Actuarial profits/losses current year	–378	–378	–378
Revaluation reserve	–781	–783	–783
Valuation of cash flow hedges	–97	–97	–97
Currency translation reserve	–137	–134	–134
Distributable profit/loss from previous year (after suspension of retained earnings)	0	0	0
Distributable profit/loss from current year	279	321	321
Non-controlling interests	1,027	1,018	1,018
Equity as shown in balance sheet	**29,640**	**29,643**	**29,643**
Effects from debit valuation adjustments			–177
Correction of revaluation reserve			313
Correction to cash flow hedges reserve			97
Correction to phase-in (IAS 19)			578
Correction to non-controlling interests (minority)			–258
Goodwill			–1,496
Intangible assets			–1,206
Surplus in plan assets			–231
Deferred tax assets from loss carryforwards			–297
Shortfall due to expected loss			–420
Prudential valuation			–367
Own shares			–33
First loss positions from securitisations			–301
Advance payment risks			–1
Deduction of offset components of Additional Tier 1 capital (AT1)			1,066
Deferred tax assets from temporary differences which exceed the 10% threshold			–166
Dividend accrual			0
Others and rounding			–250
CET1			**26,494**
Hybrid capital	1,167	1,167	1,167
Not eligible issues			–23
Others, especially hedge accounting, interests, agio, disagio			–78
Additional Tier 1 before deductions			**1,066**
Deduction of offset components of Additional Tier 1 capital (AT1)			–1,066
Additional Tier 1 after deductions			**0**
Subordinated capital	9,802	9,802	9,802
Decreased offsetting in the last 5 years of residual maturity			–3,569
Not eligible non-controlling interests			–45
Others, especially hedge accounting, interests, agio, disagio			–405
Tier 2 before deductions			**5,782**
Shortfall due to expected loss			–105
Tier 2 after deductions			**5,677**
Own funds	**40,609**	**40,612**	**32,171**

[1] Equity as shown in balance sheet.
[2] Financial reporting, equity as shown in balance sheet, regulatory group of consolidated companies.
[3] Common solvency ratio reporting, regulatory capital.

For Commerzbank as a banking group as defined in section 10a KWG and Article 11 CRR the capital relevant to the determination of regulatory capital is based on the consolidated financial statements under FINREP which is prepared based on the Groups balance sheet according to IFRS. To reconcile the requirements for regulatory capital with the slightly different amounts reported in the financial statements, capital as determined under IFRS was adjusted with the aid of so-called prudential filters.

There was no under-capitalisation of subsidiaries subject to the deduction method during the period under review.

With Basel 3, the Basel Committee on Banking Supervision published among other things comprehensive rules on the components of shareholders' equity and ratios as well as the management of liquidity risk. The Capital Requirements Directive and Regulation (CRD-IV) package of measures, constituting the European implementation of Basel 3, has been in force since 1 January 2014. The more stringent capital requirements will be phased in by 2019. Since then, numerous supplementary regulations have been published by the European Banking Authority (EBA) in particular, and are gradually entering into force. This will continue in 2017 and in subsequent years. Commerzbank has prepared itself for the more stringent capital adequacy requirements by taking a number of steps.

Capital requirements

The capital requirements set out below relate to the Commerzbank Group and include details of the requirements relating to the material consolidated units included in this Disclosure Report. The figures are the same with regard to content as in the capital adequacy reports submitted to the Deutsche Bundesbank under Basel 3 Pillar 1.

Capital requirements by risk type

Of the overall capital requirement 77% relates to default risk positions. These include balance sheet, off-balance-sheet and derivative positions, as well as advance payment risk positions. Of the total capital requirement for default risks, around €0.7bn relates to the trading book. Commerzbank uses the Advanced Internal Ratings Based Approach (advanced IRBA; in the following referred to as IRBA) to determine the regulatory capital required. Article 150 CRR gives the option of partial use. The Standardised Approach to Credit Risk (SACR) may be used for part of the portfolios.

The Commerzbank Group and accordingly the group companies included in the disclosure are, as IRBA banks as defined in Article 148 (5) CRR, generally obliged to value investments in accordance with the IRBA rules. For investments entered into prior to 1 January 2008, Commerzbank has opted to apply grandfathering. These investment positions are temporarily excluded from the IRBA and treated in accordance with the SACR rules. They are given a risk weighting of 100%. The CRR also allows items to be permanently exempted from the IRBA. Since 31 December 2009 Commerzbank has applied the option pursuant to section 70 sentence 1 no. 9b of the German Solvency Regulation (SolvV) and Article 150 CRR. All investment positions which do not fall under the above-mentioned temporary grandfathering option are valued using the permanent partial use according to SACR.

Securitised positions in the banking book and counterparty default risk positions from market value hedges in connection with securitisations also fall under the category of default risk positions subject to a capital requirement. Commerzbank treats these according to the IRBA and SACR rules for securitised positions. Capital deduction items of securitisations directly reduce the liable equity and thus are not included in the capital requirements.

Pursuant to Article 92 (3) b) and c) CRR, adequate capital must be set aside for market risk positions. Commerzbank uses an internal market risk model to calculate the regulatory capital requirement. This affects both the equity price and interest rate-related risk positions in the trading book as well as the total of currency positions and commodity positions. The standardised approaches are applied for smaller units in the Commerzbank Group in accordance with the partial use option.

To calculate the capital adequacy requirement for operational risks, Commerzbank uses the advanced measurement approach (AMA).

Table 3: Capital requirements and risk weighted assets by risk type

€m	31.12.2016		31.12.2015	
	Capital requirements	Risk weighted assets	Capital requirements	Risk weighted assets
Default risks				
Standardised Approach to Credit Risk (SACR)	**1,448**	**18,097**	**1,734**	**21,679**
Central governments or central banks	9	114	18	224
Regional or local authorities	137	1,710	169	2,114
Public sector bodies	26	323	15	185
Multilateral development banks	0	0	0	0
International organisations	0	0	0	0
Banks	47	591	81	1,018
Companies	464	5,805	658	8,227
thereof: SMEs	33	413	44	550
Retail banking	72	900	75	933
thereof: SMEs	3	35	1	11
Exposures secured by real estate property	44	544	55	682
thereof: SMEs	1	9	0	4
Defaulted positions	43	534	33	411
Particularly high risk positions	4	52	4	55
Covered debt instruments	2	20	2	20
Banks/companies with short-term external rating	0	0	0	0
Collective investment undertakings	44	549	45	564
Other exposures	556	6,954	580	7,245
Advanced approach (IRBA)	**9,529**	**119,113**	**10,170**	**127,130**
Central governments or central banks	439	5,482	545	6,811
Banks	1,684	21,046	1,845	23,066
Companies	6,018	75,224	6,348	79,346
thereof specialised lending	1,663	20,794	1,715	21,436
thereof SMEs	450	5,630	571	7,135
Retail banking	1,166	14,575	1,250	15,627
Secured by real estate property	516	6,456	754	9,425
thereof SMEs	23	285	28	344
Qualified revolving	38	477	41	508
Other	611	7,642	456	5,695
thereof SMEs	187	2,343	179	2,238
Other non-loan based assets	223	2,787	182	2,280
Securitisation risks	**227**	**2,838**	**223**	**2,782**
Securitised positions IRBA	121	1,514	93	1,163
thereof resecuritisations	1	10	4	50
Securitisation positions SACR	106	1,325	129	1,619
thereof resecuritisations	0	0	1	7
Investment risks	**97**	**1,208**	**85**	**1,066**
Investment positions SACR (permanent partial use)	97	1,208	85	1,066
thereof investments with method contin. (grandfathering)	9	111	12	148
Investment positions IRBA	0	0	0	0
Processing risk	**1**	**12**	**0**	**6**
Contribution to default fund	**13**	**164**	**1**	**7**
Non-material entities	**436**	**5,448**	**539**	**6,738**
Total default risk	**11,750**	**146,880**	**12,753**	**159,408**

Cont. Table 3: Capital requirements and risk-weighted assets by risk type

€m	31.12.2016		31.12.2015	
	Capital requirements	Risk weighted assets	Capital requirements	Risk weighted assets
Market risks in the trading book	**1,070**	**13,371**	**842**	**10,531**
Standardised Approach	**61**	**760**	**49**	**613**
Interest rate risk	25	313	29	361
thereof general price risk	19	236	23	290
thereof specific price risk	6	75	5	60
Specific price risk securitisations in trading book	0	0	0	4
Currency risk	35	444	20	246
Equity risk (general price risk)	0	2	0	1
Equity risk (specific price risk)	0	2	0	1
Commodity risk	0	0	0	0
Correlation Trading Portfolio	0	0	0	0
Internal model approach	**1,009**	**12,611**	**793**	**9,919**
Credit Value Adjustments (CVA)	**454**	**5,679**	**475**	**5,940**
Advanced	435	5,438	422	5,276
Standard	19	241	53	664
Non-material entities	57	718	76	956
Total market risk	**1,581**	**19,768**	**1,394**	**17,427**
Operational risks	**1,910**	**23,879**	**1,712**	**21,398**
Base indicator approach (BIA)	0	0	0	0
Standardised Approach	0	0	0	0
Advanced Measurement Approach (AMA)	1,910	23,879	1,709	21,362
Non-material entities	0	0	3	35
Supervisory capital requirements	**15,242**	**190,527**	**15,859**	**198,232**

The following table shows the development of risk-weighted assets in the course of the year under review for Commerzbank Group overall. In doing so the main risk drivers are given for each risk type.

Table 4: Change in risk-weighted assets in the course of the year

Risk weighted assets €bn	31.12.2016	Changes in risk weighted assets	31.12.2015
Credit risk	**146.9**	**–12.5**	**159.4**
Volume effects[1]		–4.8	
Default/Recovery		0.1	
PD/Rating		0.7	
Collaterals/recovery factor		–2.3	
Others		–6.3	
Market risk	**19.8**	**2.4**	**17.4**
Market risk (primary)		2.8	
VaR		–0.8	
Stressed VaR		3.2	
Incremental Risk		0.1	
Others		0.1	
CVA Risk Capital Charge		–0.4	
Operational risk	**23.9**	**2.5**	**21.4**
Loss data and risk scenario assessment		3.2	
Business Environment & Control System		–0.1	
Others		–0.7	
Total risk-weighted assets	**190.5**	**–7.7**	**198.2**

[1] Incl. changes in FX.

Risk-weighted assets were €190.5bn as at 31 December 2016, €7.7bn below the year-end 2015 level. The decline was mainly due to a reduction in risk assets from credit risk due to active portfolio management with increasing focus in the business, boosted by the relief effects from a securitisation. These effects were partly offset by rises in risk-weighted assets in the areas of market risk and operational risk.

Risk-oriented overall bank management

Commerzbank defines risk as the danger of possible losses or profits foregone due to internal or external factors. In risk management, we normally distinguish between quantifiable and non-quantifiable types of risk. Quantifiable risks are those to which a value can normally be attached in financial statements or in regulatory capital requirements, while non-quantifiable types of risk include reputational and compliance risk.

Risk statement

According to Article 435 (1) e) and f) CRR, the risk statement is a declaration approved by the management body providing assurance that the risk management systems put in place are adequate and giving a description of the institution's general risk profile associated with the business strategy. The approval by the Board of Managing Directors was given together with the approval of the Disclosure Report.

Banks are facing major challenges due to the persistently difficult interest rate environment, regulatory initiatives, increasingly tough competition and digitalisation, which demands significant investment. The fundamental aim of the new focused business model is to position Commerzbank as a leading, fair and competent bank with two strong customer segments: "Private and Small-Business Customers" and "Corporate Clients". Our focused growth strategy is based on digitalisation and an attractive, simplified product portfolio with a wide geographic presence. At the same time, digitalisation and a reduction in complexity will cut costs considerably. Non-strategic assets will continue to be divested, freeing up capital. Commerzbank will become simpler and more efficient and gain clear competitive advantages through the speed of digitalisation.

Our portfolio is already clearly dominated by default risks, which account for more than 65% of economically required capital, with market risk accounting for 28%. Our two main markets, Germany and Poland, in turn account for 57% of the credit exposure.

In the current difficult banking environment we wish to achieve a cost/income ratio (CIR) of under 66% and a net return on tangible equity (RoTE) of more than 6% by the end of 2020 through our strategy.

Commerzbank's business model, defined as part of the business strategy, is embedded as a set of objectives in the overall risk strategy. This takes into account exogenous factors, such as risks from the macroeconomic environment, and endogenous factors, in particular the results of the annual risk inventory. In the risk inventory process, all economically significant quantifiable and unquantifiable risks arising from our business activities are assessed in terms of their materiality for risk management. For all material risk types, corresponding sub-risk strategies are drawn up for the purposes of further detailed treatment and operationalisation.

Risk appetite refers to the maximum risk, in terms of both the amount and structure, which the Bank is willing and able to incur in pursuing its business objectives, without exposing itself to existential threats (risk tolerance). The guiding principle regarding risk appetite is to ensure that the Commerzbank Group has sufficient liquidity and capital resources on a sustained basis. Banks' core functions as transformers of liquidity and risk result in inevitable threats that can in extreme cases endanger the continued existence of the institution. For Commerzbank, in view of its business model, these inherent existential threats include e.g. the default of Germany, Poland, one or more of the other major EU countries (France, Italy, Spain or the UK, although Brexit is not deemed to be a default) or the default of the USA. Others include a deep recession lasting several years with serious repercussions for the German economy, a bank run and the collapse of global clearing houses or the foreign exchange markets, possibly triggered by a cyber-attack. In general, cyber risk is an accepted, inherent, existential risk for Commerzbank in the context of increasing digitalisation of the business environment.

Risk appetite is quantified in terms of risk limits and escalation mechanisms for liquidity and capital management, and by means of comprehensive early warning systems. Limits and guidelines are broken down across the risk types, segments and portfolios. They form an integral part of ongoing management and monitoring. In addition, regular portfolio-specific stress tests are also carried out. Our liquidity management is based on the liquidity gap profile, which determines the expected future available net liquidity from positions both on and off the balance sheet over time subject to various scenario assumptions. In addition, under Basel 3 the leverage ratio is used as a new and non-risk-sensitive indicator of indebtedness. Compliance with economic risk-bearing capacity requirements and the regulatory capital ratios is reviewed by means of an early warning system in both a forecast scenario and an adverse scenario. This is based on a gone concern approach aimed at protecting unsubordinated lenders. The approach is supplemented by scenarios aimed at ensuring the institution's continuing existence (going concern perspective).

Our Common Equity Tier 1 ratio was 13.9% at the end of 2016 under the transitional rules, or 12.3% under full application of Basel 3. For the transitional period we are aiming for a CET1 ratio of at least 12%, which should rise to more than 13% by the end of 2020. The risk-bearing capacity (RBC) ratio of 178% get: >100%) comfortably meets risk-bearing capacity requirements. Loan loss provisions were at €900m in 2016, €204m higher than in the previous year (€696m). The expected increase in loan loss provisions as compared to the previous year is still due to the tough environment in the ship finance area. Here, we expect further charges in the year 2017. The loan loss provision in the segments Private and Small-Business Customers and Corporate Clients is expected to remain on the level of the year 2016. For ship financing we are expecting a level of €450m to €600m. In the case of an unexpected massive worsening in the geopolitical or the overall economic conditions or in the event of a default of large customers, a significantly higher loan loss provision might be required.

Comprehensive, prompt, transparent and methodically adequate risk measurement is vital for ensuring that the Commerzbank Group has sufficient liquidity and capital resources on a permanent basis. Our business and risk strategy is made measurable, transparent, and controllable by the processes used. The risk measurement methods and models that we use comply with the latest common banking industry standards and are regularly reviewed by risk control, internal audit, our external auditors and the German and European supervisory authorities. The processes ensure that our risk-bearing capacity is maintained on a lasting basis. We consider our risk management methods and processes to be appropriate and effective.

Risk management organisation

Risk management at Commerzbank is an overarching bank mission and follows the principle of the “three lines of defence”. Each unit (segments and functions) forms the first line of defence within its framework of operative responsibility. For credit, market and liquidity risk the responsibility for the second line of defence lies with the Chief Risk Officer (CRO). The CRO is responsible for implementing the Group’s risk policy guidelines laid down by the Board of Managing Directors, and for the controlling of operational risks. For other risks (e.g. IT risks or legal risks) the responsibility for the second line of defence may lie outside the risk function depending on the kind of risk. The third line of defence is internal audit.

The CRO is responsible for risk management and regularly reports to the Board of Managing Directors and the Risk Committee of the Supervisory Board on the risk situation within the Group.

The responsibilities within the risk function are split between Credit Risk Management of the core business segments Private and Small-Business Customers (PSBC) and Corporate Customers (CC), Credit Risk Management Asset & Capital Recovery (ACR), Intensive Care, Market Risk Management as well as Risk Controlling and Capital Management. In all segments except for the ACR segment, credit risk management is separated into a performing loan area and Intensive Care, while in ACR it has been merged into a single unit across all rating classes. All divisions have a direct reporting line to the CRO. The heads of these risk management divisions together with the CRO make up the Risk Management Board within Group Management.

The Board of Managing Directors has sole responsibility for fundamental strategic decisions. The Board of Managing Directors has delegated operational risk management to committees. Under the relevant rules of procedure, these are the Group Credit Committee, the Group Market Risk Committee, the Group OpRisk Committee and the Group Strategic Risk Committee, which decides on risk issues of an overarching nature. The CRO chairs all these committees and has the right of veto. In addition, the CRO is a member of the Asset Liability Committee.

The Chairman of the Board of Managing Directors (CEO) bears responsibility for controlling risks related to the Bank’s business strategy, reputational risks and legal risks. The Chief Financial Officer (CFO) assumes responsibility for controlling compliance risk with particular regard to investor protection, insider trading guidelines and money laundering. The Chief Operating Officer (COO) is responsible for monitoring personnel and IT risks. Further details on the risk management organisation can be found in the Risk Report in the Annual Report 2016.

Risk strategy and risk management

The overall risk strategy, together with the business strategy, defines the strategic risk management guidelines for the development of Commerzbank’s investment portfolio. Furthermore, the risk appetite is set as the maximum risk that the Bank is prepared and able to accept while following its business objectives without exposing itself to existential threats over and above the risks inherent in the business. The guiding idea is to ensure that the Group holds sufficient liquidity and capital. Based on these requirements, suitable limits for the risk resources capital and liquidity reserve available to the Group are defined. The overarching limits of the overall risk strategy are consistent with the restructuring indicators of the recovery plan.

Banks' core functions as transformers of liquidity and risk result in inevitable threats that can in extreme cases endanger the continued existence of the institution. For Commerzbank, in view of its business model, these inherent existential threats include the default of Germany, Poland, one or more of the other major EU countries (France, Italy, Spain or the UK, although Brexit is not deemed to be a default) or the default of the USA. Others include a deep recession lasting several years with serious repercussions for the German economy, a bank run and the collapse of global clearing houses or the foreign exchange markets, possibly triggered by a cyber-attack. In general, cyber risk is an accepted, inherent, existential risk for Commerzbank in the context of increasing digitalisation. These existential threats are taken on board deliberately in the pursuit of the business targets. It may be necessary to adjust the business model and hence the business and risk strategies in the medium and long term if the Board of Managing Directors' assessment of these threats to Commerzbank changes substantially. To the extent that it is able to do so, Commerzbank makes early preparations in anticipation of forthcoming changes in regulatory requirements and accounting standards. Such changes and their (retrospective) interpretation may have lasting implications for – and even threaten the survival of – Commerzbank's business model. Commerzbank takes these "regulatory risks" into account because there are many cases where there is no option to mitigate or manage them.

The overall risk strategy covers all material risks to which Commerzbank is exposed. It is detailed further in the form of sub-risk strategies for the risk types which are material. These are then specified and made operational through policies, regulations and instructions/guidelines. By means of the risk inventory process – which is to be carried out annually or on an ad hoc basis as required – Commerzbank ensures that all risks of relevance to the Group are identified and their materiality is assessed. The assessment of the materiality of a risk is based on whether its occurrence could have a major direct or indirect negative impact on the Bank's risk-bearing capacity.

As part of the planning process, the Board of Managing Directors decides the extent to which the risk coverage potential of the Group should be utilised. On that basis, individual types of quantifiable risk contributing to the capital demand are limited in a second stage. A capital framework is allocated to the management-relevant units through the planning process. Compliance with limits and guidelines is monitored during the year, and management measures are put in place where required. In addition, further qualitative and quantitative early warning indicators are established in the overall risk strategy. Potential negative developments can be identified at an early stage with the help of these indicators.

One of the primary tasks of risk management is the avoidance of risk concentrations. These can arise from the synchronous movement of risk positions both within a single risk type (intra-risk concentrations) and across different risk types (inter-risk concentrations). The latter result from common risk drivers or from interactions between different risk drivers of different risk types.

By establishing adequate risk management and controlling processes, Commerzbank provides for the identification, assessment, management, monitoring and communication of substantial risks and related risk concentrations. This ensures that all Commerzbank-specific risk concentrations are adequately taken into account. Stress tests are regularly used to ensure transparency regarding risk concentrations. Management is regularly informed about the results of the analyses so that the potential risk of losses can be avoided in good time.

The Group Risk & Capital Monitor (GRCM) is the monthly, controlling oriented risk report for capital, credit risk, market risk, liquidity and OpRisk related subjects of Commerzbank's risk management. It comprehensively presents all risk types, including the economic and regulatory risk-bearing capacity, for Commerzbank Group. The aim of the report is to inform the Board of Managing Directors as well as the Supervisory Board's Risk Committee in a transparent and comprehensive way, to highlight important developments from a risk point of view and to manage steering impulses. Particularly, limits and guidelines of the Group Risk Strategy are monitored by the report.

Commerzbank has adopted a code of conduct that defines binding minimum standards for Commerzbank's corporate responsibility, its dealings with customers, business partners and colleagues, and its day-to-day business. It goes without saying that the Bank complies with relevant laws, regulatory requirements, industry standards and internal rules, and this therefore forms a particularly important part of its risk culture. It demands appropriate and courageous conduct in compliance with rules, and any failure to comply with rules is penalised.

The main pillar of the Bank's overall risk management and culture is the concept of "three lines of defence", which is a core element of the Corporate Charter. Under this "three lines of defence" principle, protecting against undesirable risks is an activity that is not restricted to the risk function. Each unit (segment or function) forms the first line of defence within its area of operational responsibility and is responsible for identifying and managing risks within it while complying with the prescribed risk standards and policies. For example, the front office forms the first line of defence in all business decisions and has to take risk aspects into account in reaching them. The second line of defence for each type of risk lays down standards for appropriate management of risks of that type, monitors this and ensures the application of such standards, and analyses and evaluates the risks. The risk function forms the second line of defence against credit and market risks associated with business decisions. Particularly for credit risk, this includes involvement in the credit decision process through means of a second vote. Units outside the risk function (such as Group Compliance and Group Finance) also operate as the second line of defence for certain risk types. The third line of defence is internal audit.

Under the provisions of the Remuneration Ordinance for Institutions (Institutsvergütungsverordnung), every year Commerzbank identifies, in a regular process, those employees whose actions have a material impact on Commerzbank's overall risk profile (risk takers). These risk takers are identified in accordance with regulatory requirements on the basis of their function within the organisation (including management level) and their function-related activities. Special regulations apply to risk takers as regards measuring their performance and the manner in which their variable remuneration is paid out. Information in relation to the remuneration system of Commerzbank Group according to Article 450 CRR can be found in the Remuneration Report within the Annual Report 2016 and in the separate Remuneration Report on the internet pages of Commerzbank.

The nomination committee of Commerzbank's Supervisory Board supports the Supervisory Board in identifying candidates to fill positions on bank management bodies. In doing so it considers the fair balance and variety in knowledge, skills and experiences of all members of the Board of Managing Directors, designs a job description including the applicant profile and specifies the expenditure of time related to the job. The Supervisory Board will ensure that greater attention is paid to diversity and in particular in relation to seniority, educational and professional background and will aim at achieving an appropriate degree of female representation.

With regard to the ratio legally to be set for women on the Board of Managing Directors, the Supervisory Board has set itself the objective of appointing women. It will therefore monitor the measures taken by the Board of Managing Directors to increase the percentage of women at management levels one and two as a way of systematically producing suitable female candidates for appointment to the Board of Managing Directors. The Supervisory Board of Commerzbank set the target ratio to zero as at 30 June 2017 for women on the Board of Managing Directors. In view of the present circumstances, the Supervisory Board was unable to set a higher binding target ratio for this period. It also takes the view that positions should be filled solely on the basis of qualification and expertise, regardless of gender.

The efforts of the Board of Managing Directors and the Supervisory Board in regard of qualifying women for an appointment to the Board of Managing Directors were successful. On 6 March 2016 the Supervisory Board nominated Ms Dr. Orlopp for the Board of Managing Directors. Before, Ms Dr. Orlopp was Divisional Board Member of Group Development & Strategy at Commerzbank. The effectiveness of the nomination requires supervisory approval which is expected for November 2017. Until approval is granted, Ms Dr. Orlopp will take her responsibilities as fully authorised representative of Commerzbank. After the appointment to the Board, the ratio of females in the Board will stand at 14.3%.

Additional information on corporate governance according to Article 435 (2) CRR are provided in the Annual Report 2016 (Corporate Governance Report) and on the internet pages of Commerzbank.

Information on the indicators of global systemic importance according to Article 441 CRR is given in a separate disclosure on the internet pages of Commerzbank in the section Bondholder information/Transparency disclosures.

Risk-bearing capacity and stress testing

Risk-bearing capacity analysis is a key part of overall bank management and Commerzbank's ICAAP. The purpose is to ensure that sufficient capital is held at all times.

Commerzbank monitors risk-bearing capacity using a gone concern approach which seeks primarily to protect unsubordinated lenders. This objective should be achieved even in the event of extraordinarily high losses from an unlikely extreme event. The gone concern analysis is supplemented here by elements aimed at ensuring the institution's continuing existence (going concern perspective).

When determining the economically required capital, allowance is made for potential unexpected fluctuations in value. Where such fluctuations exceed forecasts, they must be covered by the available economic capital to absorb unexpected losses (economic risk coverage potential). The quantification of the economic risk coverage potential is based on a differentiated view on the accounting values of assets and liabilities and involves economic valuations of certain balance sheet items.

The capital requirement for the risks taken is quantified using the internal economic capital model. When assessing the economic capital required, allowance is made for all the types of risk at the Commerzbank Group that are classified as material and quantifiable in the annual risk inventory. The economic risk approach therefore also comprises risk types that are not included in the regulatory requirements for banks' capital adequacy. The model also reflects diversification effects incorporating all types of risk. The confidence level of 99.91% in the economic capital model is in line with the underlying gone concern assumptions and ensures the economic risk-bearing capacity concept is internally consistent. The quantifiable risks in the economic capital model can be divided into default risk, market risk, operational risk and (although not shown separately in table 5 below) business risk, property value change risk, investment portfolio risk and reserve risk. Business risk is the risk of a potential loss resulting from discrepancies between actual income and expense and the respective budgeted figures. Business risk is considered as a deductible amount in risk coverage potential. Investment portfolio risk indicates the risk of an unexpected fall in the value of unlisted investments. Property value change risk is the risk of an unexpected fall in the value of owned property which is either already booked as an asset in the Group's balance sheet or which can be capitalised during the next twelve months by contractually assured obligations with option character (especially real estate). Reserve risk is the risk of additional charges being incurred on the portfolio of loans already in default through the creation of additional loan loss provisions. Allowance is made for this risk when considering risk-bearing capacity by means of a risk buffer. The results of the risk-bearing capacity analysis are shown using the risk-bearing capacity ratio (RBC ratio), indicating the excess of the risk coverage potential in relation to the economically required capital.

The risk-bearing capacity is monitored and managed monthly at Group level. Risk-bearing capacity is deemed to be assured as long as the RBC ratio is higher than 100%. In 2016, the RBC ratio was consistently above 100% and stood at 178% on 31 December 2016. The decrease in the RBC ratio compared with December 2015 is mainly due to the enhancements of the market risk methods as well as the market-related developments in the Public Finance portfolio. Although the RBC ratio has fallen since 31 December 2015, it still remains at a high level.

Table 5: Group's risk-bearing capacity

Risk-bearing capacity Group | €bn	31.12.2016	31.12.2015
Economic risk coverage potential[1]	**30**	**30**
Economically required capital[2]	**17**	**15**
thereof for credit risk	11	11
thereof for market risk	5	3
thereof for operational risk	2	2
thereof diversification effects	–2	–2
RBC ratio[3]	**178%**	**193%**

[1] Including potential deductible amounts for business risk.
[2] Including property value change risk, risk of unlisted investments and reserve risk.
[3] RBC ratio = economic risk coverage potential/economically required capital (including risk buffer).

The risk-bearing capacity and stress testing concept is subject to an annual internal review and is refined on an ongoing basis. The development of the regulatory environment is also taken into account.

Commerzbank uses macroeconomic stress tests to review the risk-bearing capacity in the event of assumed adverse changes in the economic environment. The scenarios on which they are based take into account the interdependence in development between the real and financial economies and extend over a time horizon of at least two years. They are updated quarterly and approved by the Asset Liability Committee (ALCO). The scenarios describe an extraordinary but plausible adverse development in the economy, focusing in particular on portfolio priorities and business strategies of relevance to Commerzbank. The scenario simulation is run monthly using the input parameters of the economic capital requirements calculation for all material and quantifiable risk types. In addition to the capital required, the profit and loss calculation is also subjected to a stress test based on the macroeconomic scenarios. Based on this, changes in the risk coverage potential are simulated. Whereas the RBC ratio is embedded into Commerzbank's limit system, guidelines for risk-bearing capacity are set as an early warning system in the stressed environment. The ongoing monitoring of the limits and guidelines is a key part of internal reporting. Defined escalations are triggered if the limit is breached.

In addition to the regular stress tests, "reverse stress tests" are implemented annually at Group level. Unlike regular stress testing, the result of the simulation – a sustained threat to the Bank – is determined in advance. The aim of the analysis process in the reverse stress test is to improve the transparency of Bank-specific risk potential and interactions of risk by identifying and assessing extreme scenarios and events. On this basis, for instance, action areas in risk management including the regular stress tests can be identified and taken into account in the ongoing development efforts.

Specific risk management

Default risk

Default risk is defined as the risk of losses sustained or profits foregone due to the default of a counterparty. It is a quantifiable material risk and includes the material sub-risk types of credit default risk, issuer risk, counterparty risk, country and transfer risk, dilution risk and reserve risk.

Risk management

Strategy and organisation

The credit risk strategy is the partial risk strategy for default risks and is derived from the overall risk strategy. It is embedded in the ICAAP process of the Commerzbank Group and forms a link between the Bank's overall risk management across all risk types and the operationalisation of default risk management. The overriding aim is to ensure the adequate structural risk quality of the credit portfolio. To this end, the credit risk strategy defines the credit risk appetite, specifies risk strategy priorities, provides an overview of the material credit risk management concepts and thereby plays an integral part in maintaining the Group's risk-bearing capacity. The credit risk strategy makes use of quantitative and qualitative management tools that give decision-makers clear guidance on both portfolio management and decisions in specific cases. Quantitative credit risk strategy guidelines limit risks with regard to poorer credit ratings and exposures with high loss-at-default contributions (concentration management) and for selected sub-portfolios. Detailed arrangements for operationalising the guidelines for selected sub-portfolios are set out in separate portfolio policies. In addition, qualitative management guidelines in the form of credit policies define the target business of the Bank. At the level of individual transactions, they regulate the transaction type with which the risk resources provided are to be used. These credit policies are firmly embedded in the credit process: transactions which do not meet the requirements are escalated through a fixed competence regulation.

The Group Credit Committee is the topmost decision-making committee for operative credit risk management, comprising two represenatives each from the back office and front office. It takes decisions in line with the competencies delegated to it by the full Board of Managing Directors and is generally responsible for the management of all credit risk. The Group Credit Committee acts on the basis of the Credit Risk Strategy in force.

Underneath the Group Credit Committee, sub-credit committees are established, respectively acting for C&FISP (Corporates & Financial Institutions & Special Products), P (Private & Small Business Customers) and IC (Intensive Care) on basis of their internal rules and procedures and within the competencies delegated by the Board of Managing Directors. They are made up of at least two representatives of the segments and two representatives of Group Risk Management. The sub-credit committees are generally in charge of managing all credit risks of the subportfolios they take responsibility for and are authorised to further delegate specific credit decisions in accordance with their competencies

Independent back office units are responsible for the operative credit risk management on portfolio and individual case level. The responsibilities are separated between the performing loan area on the one hand and Intensive Care on the other.

All credit decisions in the performing loan area are risk/return decisions. The front and back office take joint responsibility for risk and return from an exposure, with the front office having primary responsibility for the return, and the back office for the risk. Accordingly, neither office can be overruled in its primary responsibility in the lending process.

Higher-risk customers of the operative segments Private and Small Business Customers and Corporate Clients are handled by specialist Intensive Care areas. The customers are moved to these areas as soon as they meet defined criteria for assignment or mandatory transfer. The principal reasons for assignment to Intensive Care areas are criteria relating to number of days overdrawn, together with event-related criteria such as rating, third-party enforcement measures or credit fraud. Intensive Care decides on further action based on the circumstances of individual cases. Customers must be transferred to Intensive Care if they are in default (for example due to insolvency). This graduated approach ensures that higher-risk customers can continue to be managed promptly by specialists in a manner appropriate to the risks involved and in defined standardised processes.

In the ACR segment, by contrast, there is no separation of responsibilities between the performing loan area and Intensive Care. Credit risk management here has been merged into one unit across all rating classes.

The aim is to fully wind down all the assets grouped in this segment in a way that preserves value. To this end, exposure at default-based guidelines have been established and an asset management programme has been implemented. This is carried out through regular asset planning. The main aim here is to prioritise the winding down or reduction of those parts of the portfolio and individual loans for which the capital requirement is particularly high. Opportunities for selling sub-portfolios in a way that preserves value may also be used to free up capital as part of the systematic portfolio reduction. For business in Public Finance, the reduction is primarily through regular maturities of assets. Market opportunities that arise are used in a targeted way for the sale of individual assets.

Risk management

Commerzbank manages default risk using a comprehensive risk management system. The management framework comprises an organisational structure, methods and models, quantitative and qualitative management tools and regulations and processes. The risk management system ensures that the entire portfolio and the sub-portfolios, right down to individual exposure level, are managed consistently and thoroughly on a top-down basis.

The ratios and measures required for the operational process of risk management are based on overarching Group objectives. They are enhanced at downstream levels by sub-portfolio and product specifics. Risk-based credit approval regulations focus management attention in the highest decision-making bodies on issues such as risk concentrations or deviations from the risk strategy.

Management of economic capital commitment

Economic capital commitment is managed in order to ensure that the Commerzbank Group holds sufficient capital. All risk types in the overall risk strategy for economic risk capital are given limits on a Group-wide basis, with, in particular, a CVaR limit being specified. Due to the systematically restricted options for reducing default risk on a short-term basis, it is important to take account of expected trends (medium-term and long-term) in order to manage credit risk. For this reason, forecast values of credit risk parameters play a key role in ongoing management. At segment and business area level, changes to forecasts are monitored and adjustments made when necessary. There is no cascaded limit concept for credit risk below Group level, i.e. the Group credit limit is not allocated to segments or business areas.

Management of risk concentrations

The avoidance of risk concentrations is a core strategy of risk management. Risk concentrations are actively managed in order to identify at an early stage and contain the increased potential for loss in the synchronous movement of risk positions. In addition to exposure-related credit risk concentrations (bulk risks), default risk also includes country and sector concentrations. Segment-specific features are taken into account here.

A uniform definition based on “all-in” is used to manage bulk risk. The all-in concept comprises all customer credit lines approved by the Bank in their full amount – irrespective of the loan utilisation to date.

Management and the Supervisory Board’s Risk Committee are regularly informed about the results of the analyses.

Country risk management

The Group’s country risk calculation records both transfer risks and event risks defined by political and economic events which impact on the individual economic entities of a country. Country risks are managed on the basis of defined credit risk and transfer risk limits at country level. Country exposures which are significant for Commerzbank due to their size, and exposures in countries in which Commerzbank holds significant investments in comparison to the GDP of those countries, are handled by the Strategic Risk Committee on a separate basis.

Overview of management instruments and levels

	Risk strategies and policies	Limit and guideline systems	Portfolio monitoring and reporting	Structures of organisation and committees
Group	Overall risk strategy plus sub-risk strategies for significant risk types Establishment of a general risk understanding and creation of a uniform risk culture	Definition of Group limits (across all risk types) for capital and liquidity management Additional definition of guidelines as key points of the aspired target portfolio	Group Risk & Capital Monitor plus risk type specific Group formats (including flash reporting) Uniform, consolidated data repository as basis for Group reporting	Ensuring exchange of information and networking in committees that operate across all risk types Retaining qualified staff in line with progressive product innovation or regulatory adjustments
Sub-portfolios	Clear formulation of risk policy in guidelines (portfolios, asset classes, etc.) Differenciated credit authorities based on compliance of transactions with the Bank's risk policy	Performance metrics on level of risk categories and sub-portfolios Expansion of Group-wide performance metrics using sub-portfolio-specific indicators	Portfolio batches as per established portfolio calendar Asset quality review and analysis of High Attention Parts (HAP) Trigger monitoring with clear escalation and reporting lines	Interdisciplinary composition of segment committees Ensuring uniform economic opinions
Individual exposures	Rating-dependent and bulk-sensitive credit authority regulations with clear escalation processes	Limitation of bulk risk and uniform management according to model-independent all-in definition	Limit monitoring at individual exposure level Monthly report to the Board of Managing Directors on the development of bulk risks Review of individual customers/exposures resulting from asset quality review or HAP analyses	Deal team structures Institutionalized exchange within the risk function, also taking account of economic developments Sector-wise organization of domestic corporate business

Loan portfolio model

The quantification of default risks takes place through a Group-wide loan portfolio model in combination with internally developed rating systems. The risk parameters probability of default (PD), exposure at default (EaD[1]) and loss given default (LGD) are determined for every credit risk position. This enables the relevant expected loss to be calculated for each individual position.

The loan portfolio model also produces probability statements on losses from credit defaults and rating changes at portfolio level. Unexpected loss (credit value at risk – CVaR) is quantified on a risk horizon of one year. CVaR measures the extent of potential credit risk losses over and above the expected loss and must be backed by equity capital.

Commerzbank's loan portfolio model is an in-house model which, as with the CreditMetrics or Moody's KMV model, is based on the asset value approach. A Monte Carlo simulation simulates potential realisations of borrowers' assets and changes to borrowers' creditworthiness and defaults. Possible future losses at portfolio level are calculated and statistically analysed on this basis.

The loan portfolio model firstly requires transaction and customer data: level of exposure, creditworthiness, expected loss given default, country and sector classification.

Dependencies between possible default events are also modelled through around 60 systematic risk factors. Specific model parameters (correlations) measure the connection of individual borrowers to these system factors and the correlation between system factors. This way they quantify potential diversification effects between different sectors and countries.

Rating architecture

A key component of Commerzbank's rating architecture is the use of single point of methodology rating procedures, taking advantage of a central suite of computation kernels. This uniform process architecture not only facilitates risk management and monitoring but also lowers the risk of rating arbitrage within the Commerzbank Group. The rating processes are in turn embedded in rating systems. In addition to the conventional methods of assessing creditworthiness and risk, these comprise all the processes for preparing data, calculating ratings and implementing monitoring and management measures.

The use of rating processes is an essential component of risk assessment in the Commerzbank Group, irrespective of regulatory requirements. The resulting ratings are then used in front and back office credit decision-making processes, internal management processes to determine loan loss provisions under IFRS and internal measurement of CVaR and risk-bearing capacity respectively. Rating processes which have already been approved are also further revised and improved. These improvements make risk forecasts more accurate and improve management mechanisms.

The table below shows the rating processes used in the IRBA and their main elements as at the reporting date. Further models are in use at mBank. Details hereon are given in the disclosure report of mBank on their english internet page („About mbank" → „Capital Adequacy Information Policy").

Table 6: IRBA rating procedure

Scope	Procedure	Hard facts	Soft facts	Overruling
Banks	RFI-BANK	▪	▪	▪
Countries	R-SCR	▪	▪	▪
Municipalities/federal states	R-LRG	▪		▪
Corporate customers	COSCO/R-CORP	▪	▪	▪
Financial Institutions (NBFI)	NBFI	▪	▪	▪
Private customers	CORES	▪		
Commercial real estate	RS-CRE	▪	▪	▪
Renewable energies	RS-REN	▪	▪	▪
Structured finance	RS-CFD	▪	▪	▪
Ship financing	RS-SHP	▪	▪	▪
ABS transactions (sponsors)	IAA	▪	▪	

[1] Economic EaD: Expected exposure amount taking into account a potential (partial) drawing of open lines and contingent liabilities that will adversely affect risk-bearing capacity in the event of default.

Hard facts refer to system-based factors which are used in the rating process and allow no scope for interpretation. For instance, these may be data from companies' annual financial statements, the income of a private individual, or the age of the documents being used.

Soft facts refer to structured areas of analysis where the rating analyst needs to make an assessment and where there is therefore scope for discretion on a case-by-case basis. Examples include an assessment of management or the product quality of the customer being rated.

Overruling is a downstream area of analysis where there is a further opportunity for the analyst to assess circumstances separately based on his or her personal judgement. The system result can be adjusted upwards or downwards. The relevant reason for the decision is documented. Overruling should particularly be used when there are strongly fluctuating developments (e.g. market changes) such that an adequate assessment of a company's situation based on the analysis of statistical information (e.g. annual financial statements) is not sufficient to give a future-oriented probability of default. Due to the degree of freedom this gives the rating process, overruling is subject to strict standards and regular monitoring.

The Commerzbank rating method comprises 25 rating classes for loans not in default (1.0 to 5.8) and five default classes (6.1 to 6.5). The Commerzbank master scale allocates a non-overlapping range of probabilities of default that are stable over time to each rating class. The rating methods are validated and recalibrated annually so that they reflect the latest projection based on all actual observed defaults. The default ranges assigned to the ratings are the same for all portfolios. This ensures internal comparability consistent with the master scale method. For the purpose of guidance, the Commerzbank master scale shows external ratings as well as rating classes according to Article 136 CRR. However, a direct reconciliation is not possible, because external ratings of different portfolios show fluctuating default rates from year to year.

The credit approval authorities of both individual staff and the committees (Board of Managing Directors, credit committee, credit sub-committees) are graduated by a range of factors including size of exposure and rating class.

Commerzbank master scale

Commerzbank AG rating	PD and EL mid-point %	PD and EL range %	S&P scale		Credit quality steps in accordance with Article 136 CRR[1]	
1.0	0	0	AAA	AAA		
1.2	0.01	0–0.02			I	
1.4	0.02	0.02–0.03	AA+	AA		
1.6	0.04	0.03–0.05	AA, AA–			
1.8	0.07	0.05–0.08	A+, A	A	II	Investment grade
2.0	0.11	0.08–0.13	A–			
2.2	0.17	0.13–0.21	BBB+			
2.4	0.26	0.21–0.31	BBB	BBB	III	
2.6	0.39	0.31–0.47				
2.8	0.57	0.47–0.68	BBB–			
3.0	0.81	0.68–0.96	BB+			
3.2	1.14	0.96–1.34	BB	BB	IV	
3.4	1.56	1.34–1.81				
3.6	2.10	1.81–2.40	BB–			
3.8	2.74	2.40–3.10	B+			
4.0	3.50	3.10–3.90				
4.2	4.35	3.90–4.86				
4.4	5.42	4.86–6.04	B	B	V	Non-investment grade
4.6	6.74	6.04–7.52				
4.8	8.39	7.52–9.35	B–			
5.0	10.43	9.35–11.64				
5.2	12.98	11.64–14.48	CCC+,			
5.4	16.15	14.48–18.01	CCC, CCC–,	CCC,	VI	
5.6	20.09	18.01–22.41	CC, C	CC, C		
5.8	47.34	22.41–99.99				
6.1		>90 days past due				
6.2		Imminent insolvency				
6.3	100	Restructuring with recapitalisation		D		Default
6.4		Termination without insolvency				
6.5		Insolvency				

[1] CRR = Capital Requirements Regulation (EU) No 575/2013.

Commerzbank has defined an implementation plan for the successive transition of the SACR portfolios into the IRBA. As at 31 December 2016, Commerzbank has an IRBA coverage ratio at Group level of 98.7% for IRBA exposure values and 94.8% for risk weighted IRBA exposure values, exceeding the IRBA exit threshold of 92% under section 10 of the Solvency Regulation (in the version applicable as at 1 January 2014). For loans and receivables that are not covered by the procedures approved by the supervisory authorities for the IRBA, the standardised approach for credit risk (SACR) applies, under which flat risk weightings are to be used or risk weightings are to be based on external assessments of the borrower's creditworthiness.

Risk parameters

In addition to classifying the default risk within the scope of the rating process, correctly assessing loss severity is essential for a reliable and holistic risk assessment. The loss severity is determined firstly by the exposure at default (EaD) and secondly by the loss given default (LGD).

When forecasting EaD unused credit lines and other contingent liabilities are included via credit conversion factors (CCFs). Depending on the transaction and the customer, the CCFs describe the probability of drawdown in the event of a default within the next twelve months.

The LGD is primarily determined by the expected proceeds from collateral and unsecured portions of loans. Proceeds from collateral are modelled via recovery rates representing a discount on the previously defined market value. The recovery rate depends on the characteristics of the collateral. For instance, when modelling for properties, the collateral is differentiated by property type and location. To determine the proceeds on unsecured portions of loans, the focus is primarily on the characteristics of the customer and the transaction.

The CCF and LGD models are based on bank-internal empirical loss data. For this purpose, Commerzbank refers to a database of internal credit defaults since 1997. New defaults are recorded continuously and are made available for statistical analysis once processing is complete. For quality assurance purposes, the data collection process is monitored by a number of controls and automatic checking procedures.

Both the internal and regulatory requirements of the CRR are taken into account when developing statistical models for estimating EaD and LGD. Discussions with experts from back office and debt workout departments play an important role when validating the results and identifying relevant factors. In instances where there is only a small number of historical default or collateral utilisation cases, the empirical analyses are supplemented with expert assessments. All of the models are regularly validated and recalibrated on the basis of the new findings. Empirically-based LGD and EaD parameters are used in all important internal processes at Commerzbank. The suitability of the models was verified by the Bundesbank and the BaFin as part of the inspection prior to the granting of authorisation for the advanced IRBA.

Finally, combining the above components yields an assessment of the expected loss (EL = EaD*PD*LGD) and the risk density as a ratio of EL to EaD (EL to EaD in basis points). The internal master scale is used to clearly allocate borrower PDs (customer ratings) and loan commitment risk densities (credit ratings) to the Bank's internal rating classes.

Validation

Pursuant to Article 185 CRR, all risk classification procedures are subject to a regular validation and calibration of parameters. Risk Management, which is independent of the front office units, is responsible for preparing the validation reports. The validation outcome and resulting need for action are presented for approval to a designated validation committee in which the management body is also represented. A summary of the validation committee's results as well as any irregularities and necessary changes are presented to the Bank's Strategic Risk Committee for approval. Regular monitoring of procedures is an additional system control element. To check the quality of the rating procedures, Internal Audit regularly reviews the methods and processes used and inspects validation and monitoring methods.

Detailed validation concepts are defining which analyses have to be carried out rotationally for the rating systems as well as for EaD and LGD models. All of the analysis results are grouped and evaluated using a traffic-light system. If the standards and limits that have been defined in the validation concept are not met, the specific causes must be established. Concrete steps must then be defined along with a timetable for implementing them. These steps may include, for instance, measures to improve data quality or a revision of the process in question.

Generally a distinction is made between quantitative and qualitative reviews of the models. Data quality aspects and statistical analyses are of specific interest in the quantitative validation. This involves comparing the model forecasts with the reality over the course of the assessment period. The quality of the forecasts is verified using statistical methods. Assessing the discriminatory power of rating procedures may involve using Gini coefficients, concordance indices and hit rate analyses, for instance. The calibration of procedures may be checked using various statistical tests, such as the Spiegelhalter or binomial test.

Depending on the type of model a different validation procedure to back-test each single model has to be applied, as described in the following:

- **Default/non-default rating procedure:** In default/non-default models, ratio selection, parameter estimates and calibration are mainly based on internal default periods. A check is therefore made during validation to ascertain whether the internally measured default rates tally with the predicted probabilities of default. Discriminatory power is also checked by calculating the AUC value, and the Gini coefficient respectively.
- **Shadow rating procedure:** The classic back-testing methods used for default/non-default models cannot normally be applied to portfolios with very few defaults. Consequently, back-testing in shadow rating procedures relies very heavily on comparisons with external ratings. Comparing the Bank's internal ratings with those of external agencies (Standard & Poor's, Moody's and FitchRatings) gives indications of how the Bank's credit rating estimates should be classified in relative terms. For this benchmarking, contingency tables, for example, are produced, variances analysed and the correlation coefficient determined according to Spearman. A benchmarking analysis is naturally only useful or possible if a large number of external ratings are available. If this is not the case, pseudo discriminatory power values, for example, can be calculated using either external or final internal ratings.
- **Hybrid models:** Hybrid models are basically mixtures of default/non–default models and shadow rating procedures. In some low-default portfolios, an internal data history has had time to develop. While this alone is not sufficient to develop a default/non-default model and corresponding validation, the available data history is yet being incorporated for validation or development purposes. The validation techniques of default/non-default models and shadow rating procedures are combined in these procedures.
- **Cash flow-based procedures:** In rating procedures for special funding, the customer's credit rating derives principally from the cash flows generated by the rating object. Typically, the rating procedures are therefore based on cash flow simulations using stochastic processes. The procedures are normally used in low default and low number respectively portfolios for which only very few external benchmarks exist. The models are therefore causally produced and often calibrated using expert knowledge. Direct comparisons of the predicted PDs with realised default rates and discriminatory power analyses using the AUC are not normally very meaningful due to the low number of defaults. The statistical testing of EaD and LGD predictions of these models are likewise difficult. Key elements of the validation of these procedures are descriptive analyses of the input data and comparisons of the cash flows and volatilities predicted by the users with actual cash flows.
- **Wholly expert-based PD procedures:** No external target criterion is available for these procedures and there are no cash flow simulations. Calibration is based wholly on expert knowledge. Validation is therefore very heavily reliant on expert know-how, as is the development. For the validation, the results produced by the procedure in particular are compared with the expert opinion, e.g. by evaluating the overruling pattern.
- **EaD and LGD models:** On the basis of additional default and loss data full-sample and out-of-sample tests are carried out through statistical backtests. In this context the validity of existing parameter differentiations and the discriminatory power of the applied risk factors have always to be analysed. Data quality and the representativeness of observations for future loss events are also important subjects of analyses.

The following table gives an overview of the quantitative validation procedures used for the individual rating procedures:

Table 7: Validation of IRBA rating procedures

	PD-Validation		EaD-/LGD-Validation	
Rating procedure	**Methodology**	**Data history** Years	**Methodology**	**Data history** Years
RFI-BANK	Shadowrating, Default/non-default	5	Calibrated empirically	17
R-SCR	Shadowrating	5	Calibrated empirically	17
R-LRG	Shadowrating	11	Expert-based	–
COSCO/R-CORP	Shadowrating, Default/non-default	5	Calibrated empirically	17
NBFI	Expert-based, Shadowrating	5	Expert-based	–
CORES	Default/non-default	5	Calibrated empirically	17
RS-CRE	Default/non-default, Shadowrating	5	Calibrated empirically	9
RS-CFD	Cash flow simulation	5	Cash flow simulation	9
RS-REN	Cash flow simulation	5	Cash flow simulation	9
RS-SHP	Cash flow simulation	5	Cash flow simulation	12
ABS IAA	IAA-methods[1]	–	IAA-methods[1]	–

[1] For internal classification procedure for securities see page 56.

Qualitative validation is carried out in cooperation with the users of the risk models and particularly takes procedural conditions into consideration. This includes compliance of the procedures with regulations, overruling analyses and the general user acceptance. For EaD and LGD procedures the precise technical implementation of parameters in all using systems has to be verified. Asset Quality Reviews established in the back office also guarantee a continuously reliable data quality and the implementation of the model true to the process. By way of example the monthly reporting of rating coverage to the Board of Managing Directors ensures that the portfolios are valued using up-to-date and valid rating analyses.

The validations carried out in 2016 were largely unremarkable. A conservative adjustment was made to loss ratios for ship financing. In addition for some LGD models the cost component has been recalibrated due to reduced unit costs. As part of ongoing model maintenance, procedural refinements were made in 2016 that had not been triggered by findings in validation. For the rating procedure for banks (RFI-BANK) the financial analysis calibration has been updated. In the case of the special financing procedures RS-REN and RS-CFD conservative elements in the context of the treatment of negative interest rates have been removed. For the rating procedure used for corporate clients R-CORP/COSCO a score combination which is mainly relevant for small and medium corporate customers was conservatively adjusted. Apart from that only minor changes were made to the rating procedures. The table below summarises the validation results for all separately calibrated IRBA parameters and sub-models, differentiated by PD, LGD and EAD procedures. It shows the cases in which the tolerance limits set by the corresponding validation concepts were exceeded, thereby making adjustments necessary.

Some of the changes went live during the year 2016 and some were implemented in the productive systems at the turn of the year 2016/2017. Overall the measures are expected to increase RWA by around €0.5bn. These effects will feed through fully until the end of 2017.

Table 8: Validation results

	PD		LGD		EaD	
Validation	**Number**	**EaD in %**	**Number**	**EaD in %**	**Number**	**EaD in %**
Adequate	**43**	**91**	**263**	**71**	**25**	**97**
Too conservative – adjustment necessary	**1**	**1**	**30**	**26**	**1**	**0**
Too progressive – adjustment necessary	**1**	**8**	**25**	**3**	**5**	**3**
Total	**45**	**100**	**318**	**100**	**31**	**100**

Risk mitigation

At Commerzbank, risks are mitigated via a range of measures including collateral and netting.

The collateral mainly takes the form of mortgages on owner-occupied and rented residential properties, mortgages on commercial properties, financial collateral as well as guarantees and indemnity letters. The ship finance portfolio is mostly backed by ship mortgages.

Within the scope of IRBA assessments, processes for offsetting collateral instruments were recognised; in particular this includes land charges, financial collateral, guarantees, indemnity letters, credit derivatives, life insurances, mortgage liens in the land register and other real collateral.

In the IRBA, the Bank takes account of credit risk mitigating effects arising from the receipt of eligible guarantees (guarantees/sureties, comparable claims on third parties) by using the risk parameters (PD and LGD) of the guarantor. Under the SACR, the Bank uses the risk weightings laid down by the supervisory authority.

Regulatory setting-off provided, as part of the assessment of their declaration of liability, guarantors are subject to a review of their creditworthiness and rating in accordance with their sector and business. The aim of the creditworthiness review is to establish a guarantor's maximum ability to pay.

An overview of the main types of guarantors and credit derivatives' counterparties, broken down by rating classes, is given in the following two tabes:

Table 9: Guarantors and credit derivatives' counterparties by main type and rating classes (IRBA)

IRBA Exposure €m	Rating 1 (0.00-0.08%)	Rating 2 (0.08-0.68%)	Rating 3 (0.68-3.10%)	Rating 4 (3.10-9.35%)	Rating 5 (9.35-99.99%)	Rating 6 (100%)	Total
Public sector, defence and social security	5,730	1,508	0	0	0	0	7,238
Banks and financial institutions	1,070	938	56	0	8	0	2,073
Insurance companies	459	1,234	9	0	0	0	1,702
Industries	50	895	181	19	9	0	1,154
Other service companies	109	305	106	27	15	0	560
Private households	104	42	8	0	0	0	155
Other	2	10	5	1	0	0	18
Total IRBA 2016	**7,523**	**4,933**	**364**	**47**	**33**	**0**	**12,900**
Total IRBA 2015	5,746	4,020	466	51	19	0	10,302

Table 10: Guarantors and credit derivatives' counterparties by main type and rating classes (SACR)

SACR | Exposure €m	AAA	AA	A	BBB	BB	n.a.	Total
Public sector, defence and social security	448	55	15	0	0	0	518
Banks	47	0	27	0	0	0	74
Private households	0	0	0	0	0	0	0
Other	4	0	0	0	0	56	60
Total KSA 2016	**499**	**55**	**42**	**0**	**0**	**56**	**653**
Total KSA 2015	3,424	451	24	480	0	69	4,447

In accordance with the CRR, the quality of the collateral received is subject to rigorous review and is continuously monitored. In particular, this includes establishing the legal enforceability of the collateral and ensuring that it is valued regularly. The recoverability of the collateral instruments is reviewed on a regular basis during the term of a loan as part of regular credit processing. Depending on the collateral type, this takes place at adequate intervals, at least annually or as circumstances require. Positive correlations between the creditworthiness of the borrower and the value of the collateral or guarantee are established in the lending process and collateral instruments affected are not offset. Collateral for corporate customers is processed exclusively by the risk function's collateral management unit.

The Bank carries out collateral concentration analyses for all lending collateral (physical and personal collateral). Various aspects such as collateral category, borrower's rating class and regional allocation of the collateral are examined. With reference to these aspects, the Board of Managing Directors is kept informed on a regular basis of the development of the collateral pool and possible anomalies/concentrations.

The valuation and processing of collateral are governed by universally applicable standards and collateral-specific instructions (guidelines, descriptions of processes, IT instructions, legally validated standard contracts and samples). The standards established to hedge against or mitigate the risks of loans, which also take account of the regulatory requirements of CRR, include:

- Legal and operational standards for documentation and data collection as well as valuation standards.
- The standardisation and updating of collateral valuations are ensured by laying down valuation processes, prescribing standardised valuation methods, parameters and defined discounts for collateral, clearly defining responsibilities for the processing and valuation process, and stipulating requirements for revaluations at regular intervals.
- Other standards for taking account of specific risks, e.g. operational risks, correlation and concentration risks, market price change risks (e.g. due to currency fluctuations), country risks, legal risks or risks of changes in the law, and risks of insufficient insurance cover.

For the vast majority of its derivative default risk positions, Commerzbank Group uses the internal model method (IMM) according to Article 283 CRR. The credit equivalent amounts are determined as expected future exposure through the simulation of various market scenarios, taking netting and collateral into account.

Also for securities repurchase, lending and comparable transactions involving securities or goods, the exposures are determined in accordance with Article 283 and Article 273 (2) CRR on the basis of an internal model method. Guarantees and credit derivatives are taken into account via the substitution approach. The double-default procedure defined under Article 153 (3) CRR is applied.

Quantitative information on default risks

Commerzbank Group's IRBA portfolio

The IRBA portfolio of all Commerzbank Group companies included in this Disclosure Report is shown below, broken down into the relevant IRBA asset classes. The structuring of the rating classes corresponds to the Commerzbank internal management via the PD master scale. These have been grouped into five main classes for reasons of clarity. Rating classes 6.1 to 6.5 comprise borrowers in default according to IRBA regulations, whereby the IRBA definition of default is also used for internal purposes. The risk parameters PD and LGD are calculated as exposure-weighted averages; the same also applies to the average risk weighting (RW).

The IRBA exposure value refers to the risk exposure values to be defined according to Article 166 CRR. These represent the expected amounts of the IRBA position that will be exposed to a risk of loss. The risk exposure value for off-balance-sheet default risk exposures is calculated by multiplying with a conversion factor.

The companies in the Commerzbank Group use the Advanced IRB. They may therefore use the internal estimates of credit conversion factors (CCFs) for regulatory purposes, too. CCFs are necessary for off-balance-sheet transactions in order to assess the likely exposure in the event of a possible default on commitments that have not yet been drawn.

In tables 11 to 15, only portfolios which fall under the scope of application of the IRBA and are rated with a rating process that has been approved by the supervisory authority are shown. Positions in the risk exposure class other non-loan-related assets are not listed. These assets amounting to €2.7bn do not have any creditworthiness risks and are therefore not relevant for the management of default risks. Furthermore, mBank S.A. positions in the amount of €1.7bn are not included; they are subject to the IRBA slotting approach. Securitisation positions in the IRBA are presented separately in the securitisations section in this chapter.

The risk exposure values shown in this section generally differ from the EaD values in the Annual Report (economic EaD) due to the following:

- For derivative positions, there are differences in definitions between the exposures reported in the Annual Report and the regulatory figures presented in this Disclosure Report.
- Some transactions are not included in risk-weighted assets (RWA) for regulatory purposes but are included in the EaD of the Annual Report and Risk Report respectively.
- The figures presented in this Disclosure Report relate to six entities within the Commerzbank Group considered important for disclosure. By contrast, the figures in the Annual Report relate to all companies that have to be consolidated according to IFRS.

All of the IRBA exposures are presented as follows:

Table 11: IRBA exposures by rating class – on-balance and off-balance

		Investment Grade		Non-Investment Grade			Default	
Asset class €m		**Rating 1 (0.00-0.08%)**	**Rating 2 (0.08-0.68%)**	**Rating 3 (0.68-3.10%)**	**Rating 4 (3.10-9.35%)**	**Rating 5 (9.35-99.99%)**	**Rating 6 (100%)**	**Total**
Central governments or central banks	EaD	9,413	12,123	633	213	181	0	22,562
	Ø LGD %	30.4	23.9	76.7	96.2	69.0	20.0	29.1
	Ø PD %	0.0	0.2	0.9	3.9	12.4	100.0	0.3
	Ø RW %	9.9	20.8	131.9	278.8	330.6	0.0	24.3
	RWA	933	2,522	835	594	598	0	5,482
Institutions	EaD	19,688	19,008	7,629	2,249	337	104	49,016
	Ø LGD %	39.0	38.2	38.1	17.1	23.9	74.8	37.5
	Ø PD %	0.0	0.3	1.3	7.0	25.0	100.0	1.0
	Ø RW %	17.6	48.9	85.1	55.3	125.8	56.1	42.8
	RWA	3,468	9,291	6,496	1,244	424	58	20,981
Corporates	EaD	15,981	88,500	22,156	5,714	4,034	4,921	141,305
	Ø LGD %	37.8	38.5	36.1	33.1	27.5	51.0	38.0
	Ø PD %	0.0	0.3	1.3	5.2	41.2	100.0	5.3
	Ø RW %	19.0	45.2	77.8	108.5	121.0	50.2	52.3
	RWA	3,044	40,044	17,244	6,197	4,882	2,471	73,882
thereof specialised lending	EaD	5,972	10,364	4,584	3,261	3,351	2,461	29,993
	Ø LGD %	35.7	38.6	32.5	31.5	26.9	46.8	35.7
	Ø PD %	0.0	0.3	1.5	5.4	45.1	100.0	14.2
	Ø RW %	19.1	49.3	81.5	109.1	118.5	78.5	64.9
	RWA	1,143	5,110	3,737	3,559	3,969	1,933	19,451
thereof SMEs	EaD	1,055	5,145	3,372	893	231	598	11,295
	Ø LGD %	28.3	32.7	36.7	35.0	31.4	59.7	35.1
	Ø PD %	0.0	0.3	1.5	5.1	18.1	100.0	6.6
	Ø RW %	11.0	34.5	69.9	92.6	122.0	46.0	49.8
	RWA	116	1,773	2,357	827	282	275	5,630
Retail	EaD	36,802	49,957	12,363	3,286	1,857	1,220	105,485
	Ø LGD %	25.2	23.2	29.3	30.1	21.1	54.2	25.2
	Ø PD %	0.0	0.3	1.4	5.3	23.4	100.0	2.0
	Ø RW %	2.4	11.0	32.4	53.8	71.8	89.1	13.8
	RWA	882	5,505	4,001	1,766	1,334	1,087	14,575
Total	**EaD**	**81,883**	**169,587**	**42,781**	**11,462**	**6,409**	**6,245**	**318,368**
	Ø LGD %	**31.6**	**32.9**	**35.1**	**30.3**	**26.6**	**52.1**	**33.0**
	Ø PD %	**0.0**	**0.3**	**1.3**	**5.5**	**34.3**	**100.0**	**3.2**
	Ø RW %	**10.2**	**33.8**	**66.8**	**85.5**	**112.9**	**57.9**	**36.1**
	RWA	**8,326**	**57,362**	**28,576**	**9,801**	**7,238**	**3,616**	**114,919**

Table 12: IRBA exposures in retail banking by rating classes – on-balance and off-balance

		Investment Grade		Non-Investment Grade			Default	
Asset class €m		**Rating 1 (0.00-0.08%)**	**Rating 2 (0.08-0.68%)**	**Rating 3 (0.68-3.10%)**	**Rating 4 (3.10-9.35%)**	**Rating 5 (9.35-99.99%)**	**Rating 6 (100%)**	**Total**
Retail banking	**EaD**	**36,802**	**49,957**	**12,363**	**3,286**	**1,857**	**1,220**	**105,485**
	Ø LGD %	**25.2**	**23.2**	**29.3**	**30.1**	**21.1**	**54.2**	**25.2**
	Ø PD %	**0.0**	**0.3**	**1.4**	**5.3**	**23.4**	**100.0**	**2.0**
	Ø RW %	**2.4**	**11.0**	**32.4**	**53.8**	**71.8**	**89.1**	**13.8**
	RWA	**882**	**5,505**	**4,001**	**1,766**	**1,334**	**1,087**	**14,575**
Secured by mortgages on immovable property, excluding SMEs	EaD	23,970	33,214	4,981	1,128	705	507	64,506
	Ø LGD %	14.6	14.9	15.6	16.3	18.1	39.3	15.1
	Ø PD %	0.0	0.3	1.3	5.5	20.8	100.0	1.4
	Ø RW %	2.0	7.6	24.1	58.5	100.6	120.1	9.6
	RWA	478	2,516	1,198	660	709	609	6,171
Secured by mortgages on immovable property, SMEs	EaD	57	676	264	38	39	49	1,123
	Ø LGD %	14.9	19.6	19.3	24.7	28.2	53.3	21.3
	Ø PD %	0.0	0.3	1.3	5.4	19.3	100.0	5.7
	Ø RW %	1.5	8.8	23.5	65.2	121.0	184.4	25.4
	RWA	1	59	62	25	47	91	285
Qualifying revolving	EaD	5,946	1,245	462	114	35	8	7,810
	Ø LGD %	59.4	59.5	59.9	60.2	60.1	74.6	59.5
	Ø PD %	0.0	0.3	1.4	5.3	16.8	100.0	0.4
	Ø RW %	1.6	8.0	31.0	78.7	145.6	0.0	6.1
	RWA	93	100	143	90	52	0	477
Other, excluding SMEs	EaD	6,455	10,965	3,805	848	714	365	23,152
	Ø LGD %	32.7	39.6	39.6	39.4	16.2	64.0	37.3
	Ø PD %	0.0	0.3	1.4	5.0	29.1	100.0	3.0
	Ø RW %	4.5	20.4	43.8	60.0	46.2	73.2	22.9
	RWA	293	2,235	1,666	509	330	267	5,300
Other, SMEs	EaD	373	3,857	2,851	1,158	364	291	8,894
	Ø LGD %	37.4	36.9	35.6	34.0	31.9	67.5	36.9
	Ø PD %	0.1	0.3	1.5	5.2	18.3	100.0	5.3
	Ø RW %	4.5	15.4	32.7	41.7	54.0	41.2	26.3
	RWA	17	595	932	483	197	120	2,343

The following two tables solely show off-balance sheet IRBA-positions:

Table 13: IRBA exposures for off-balance sheet transactions by rating class – unutilised lending commitments

		Investment Grade		Non-Investment Grade			Default	
Asset class €m		**Rating 1 (0.00-0.08%)**	**Rating 2 (0.08-0.68%)**	**Rating 3 (0.68-3.10%)**	**Rating 4 (3.10-9.35%)**	**Rating 5 (9.35-99.99%)**	**Rating 6 (100%)**	**Total**
Central governments or central banks	Total sum	663	38	86	50	79	0	918
	Ø CCF (%)	48	49	49	46	49	0	48
	EaD[1]	321	19	43	9	7	0	398
	Ø EaD	12	3	14	28	101	0	14
Institutions	Total sum	630	1,309	619	190	49	0	2,797
	Ø CCF (%)	46	48	48	49	45	45	48
	EaD	301	630	183	58	15	0	1,186
	Ø EaD	37	42	94	40	9	0	48
Corporates	Total sum	9,537	69,532	10,229	1,552	485	123	91,459
	Ø CCF (%)	45	46	45	47	45	45	46
	EaD	4,449	31,939	4,480	613	216	55	41,754
	Ø EaD	60	78	14	34	11	2	68
thereof specialised lending	Total sum	934	844	433	402	370	16	2,999
	Ø CCF (%)	48	47	53	50	44	49	48
	EaD	637	888	255	201	165	8	2,154
	Ø EaD	78	16	42	44	13	1	39
thereof SMEs	Total sum	259	1,803	1,107	197	34	23	3,423
	Ø CCF (%)	42	43	48	51	50	39	45
	EaD	107	778	509	99	16	8	1,517
	Ø EaD	1	2	5	2	1	1	3
Retail	Total sum	14,116	11,368	3,103	507	65	14	29,172
	Ø CCF (%)	63	65	62	54	55	39	63
	EaD	8,931	7,319	1,903	270	35	6	18,463
	Ø EaD	0	10	0	2	0	0	4
thereof secured by mortgages on immovable property, SMEs	Total sum	0	34	13	1	0	0	48
	Ø CCF (%)	99	94	119	101	225	0	101
	EaD	0	32	14	1	0	0	48
	Ø EaD	0	0	0	0	0	0	0
thereof secured by mortgages on immovable property, excluding SMEs	Total sum	665	1,087	172	14	2	0	1,940
	Ø CCF (%)	100	99	100	98	88	38	99
	EaD	662	1,079	171	14	2	0	1,928
	Ø EaD	0	0	0	0	0	0	0
thereof qualified revolving	Total sum	9,737	1,640	391	64	10	0	11,842
	Ø CCF (%)	59	58	56	57	57	53	59
	EaD	5,763	944	220	37	6	0	6,969
	Ø EaD	0	0	0	0	0	0	0
thereof other SMEs	Total sum	542	4,204	1,438	264	36	10	6,493
	Ø CCF (%)	43	46	48	47	47	41	47
	EaD	231	1,928	690	123	17	4	2,992
	Ø EaD	1	1	0	0	0	0	1
thereof other, excluding SMEs	Total sum	3,172	4,404	1,089	163	17	4	8,849
	Ø CCF (%)	71	76	74	59	64	34	73
	EaD	2,275	3,336	808	96	11	1	6,527
	Ø EaD	1	26	1	5	0	0	14
Total	**Total sum**	**24,947**	**82,247**	**14,037**	**2,299**	**678**	**138**	**124,346**
	Ø CCF (%)	55	49	49	49	46	45	50
	EaD	14,002	39,907	6,609	949	274	61	61,802
	Ø EaD	25	68	13	26	12	2	52

[1] EaD is calculated from the assessment basis, CCFs, collateral deposits and withdrawals, and substitution effects.

Table 14: IRBA exposures for off-balance sheet transactions by rating class – other unutilised non-derivative off-balance sheet assets[1]

		Investment Grade		Non-Investment Grade			Default	
Asset class €m		**Rating 1 (0.00-0.08%)**	**Rating 2 (0.08-0.68%)**	**Rating 3 (0.68-3.10%)**	**Rating 4 (3.10-9.35%)**	**Rating 5 (9.35-99.99%)**	**Rating 6 (100%)**	**Total**
Central governments or central banks	Total sum	108	122	64	50	282	0	626
	Ø CCF (%)	38	56	38	43	16	0	32
	EaD[2]	41	69	24	22	41	0	196
	Ø EaD	1	4	0	0	22	0	10
Institutions	Total sum	1,498	2,514	1,678	1,454	304	6	7,453
	Ø CCF (%)	78	50	46	46	46	33	54
	EaD	1,180	1,251	735	578	111	2	3,857
	Ø EaD	56	18	7	24	4	0	24
Corporates	Total sum	3,261	18,201	4,099	365	341	254	26,521
	Ø CCF (%)	37	37	25	27	22	26	35
	EaD	1,611	6,839	824	94	74	64	9,505
	Ø EaD	24	27	13	1	1	1	24
thereof specialised lending	Total sum	235	178	189	25	36	19	682
	Ø CCF (%)	33	28	27	26	24	20	31
	EaD	420	195	56	7	9	4	690
	Ø EaD	7	2	1	0	0	1	5
thereof SMEs	Total sum	690	782	389	94	36	26	2,018
	Ø CCF (%)	44	24	33	26	30	42	33
	EaD	303	184	124	23	11	11	655
	Ø EaD	84	0	1	0	1	0	29
Retail	Total sum	117	548	181	44	12	20	921
	Ø CCF (%)	26	24	26	29	25	32	25
	EaD	31	129	46	12	3	6	228
	Ø EaD	0	0	0	0	0	0	0
thereof secured by mortgages on immovable property, SMEs	Total sum	0	0	0	0	0	0	0
	Ø CCF (%)	0	0	0	0	0	0	0
	EaD	0	0	0	0	0	0	0
	Ø EaD	0	0	0	0	0	0	0
thereof secured by mortgages on immovable property, excluding SMEs	Total sum	0	0	0	0	0	0	0
	Ø CCF (%)	0	0	0	0	0	0	0
	EaD	0	0	0	0	0	0	0
	Ø EaD	0	0	0	0	0	0	0
thereof qualified revolving	Total sum	0	0	0	0	0	0	0
	Ø CCF (%)	0	0	0	0	0	0	0
	EaD	0	0	0	0	0	0	0
	Ø EaD	0	0	0	0	0	0	0
thereof other SMEs	Total sum	48	486	161	38	11	16	761
	Ø CCF (%)	23	23	26	28	25	33	24
	EaD	11	112	40	10	3	5	182
	Ø EaD	0	0	0	0	0	0	0
thereof other, excluding SMEs	Total sum	69	62	20	5	2	3	160
	Ø CCF (%)	28	27	30	37	22	24	28
	EaD	20	17	6	2	0	1	45
	Ø EaD	0	0	0	0	0	0	0
Total	**Total sum**	**4,984**	**21,385**	**6,022**	**1,912**	**939**	**280**	**35,521**
	Ø CCF (%)	47	39	32	42	27	26	39
	EaD	2,863	8,288	1,629	706	229	72	13,786
	Ø EaD	31	25	10	18	8	1	23

[1] Securities lending and repurchase transactions are not included. [2] EaD is calculated from the assessment basis, CCFs, collateral deposits and withdrawals, and substitution effects.

The following table shows the scope of the credit risk mitigation effects of financial collateral, guarantees, credit derivatives, mortgage liens and life insurances under the IRBA. In addition to the collateral in the SACR, under the IRBA some physical and other collateral which is only eligible for recognition under the IRBA is also offset. In the table below, financial collateral and IRBA collateral are shown separately from the guarantees.

Table 15: Total collateralised IRBA exposures[1]

Asset class €m	Financial collateral	Guarantees	Life insurances	Credit derivatives	Mortgage liens	Other IRBA-collateral[2]	Total
Central governments or central banks	31	377	0	0	0	0	407
Institutions	1,504	2,696	0	20	14	50	4,284
Corporates	1,819	8,779	164	729	8,864	3,955	24,312
thereof specialised lending	134	346	46	0	5,033	0	5,560
thereof SMEs	709	611	38	0	1,835	836	4,028
Retail	2,294	264	1,161	0	52,179	281	56,180
Secured by mortgages on immovable property	806	29	961	0	46,889	1	48,686
thereof SMEs	8	20	12	0	946	0	987
Qualifying revolving	0	0	0	0	0	0	0
Other	1,489	235	200	0	5,290	280	7,494
thereof SMEs	159	184	31	0	803	279	1,458
Other non credit-obligation assets	0	0	0	0	0	0	0
Total 2016	**5,649**	**12,115**	**1,325**	**749**	**61,058**	**4,287**	**85,183**
Total 2015	7,330	9,840	1,339	563	57,387	4,137	80,596

[1] For reasons of materiality, secured investment positions are not represented.
[2] Amongst others financial receivables (release of covenant) and other physical collateral.

The calculation of collateral is based on market values weighted with recovery rates. These recovery rates are based on empirical data and form part of the LGD models. By definition, the rates cannot exceed 100%; therefore, the figures shown are normally lower than the market values. By contrast, under the IRBA the substitution approach is used to offset guarantees and credit derivatives. The protection therefore does not take effect in the LGD, as is the case with financial and other IRBA collateral, but via the substitution of the debtor's risk parameters with those of the guarantor. Alternatively, the double-default procedure may be used in the IRBA.

Table 53 in the Appendix contains an overview of the exposure-weighted averages of the credit risk parameters PD and LGD by asset class and relevant geographical location (countries in which Commerzbank has been authorised or has a branch or a subsidiary).

Commerzbank Group's SACR portfolio

The portfolios currently excluded from the IRBA are measured in accordance with SACR regulations as permitted under partial use provisions. In contrast to the IRBA, the SACR is largely based on a flat risk weighting or external ratings. Commerzbank has nominated the rating agencies Standard & Poor's Rating Services, Moody's Investors Service and FitchRatings for the use of external ratings.

Where an external credit rating is available for a position, that external rating is used to determine the risk weighting. Where two or more external credit ratings are available for one position, the risk weighting is assigned in accordance with the provisions of Article 138 CRR.

For unrated positions, if the conditions set out in Articles 139 and 140 CRR are met, a risk weighting is calculated on the basis of a derived credit rating. In all other cases, the position is treated as an unrated exposure.

External ratings for positions in local currency are not used to derive risk weightings for foreign currency exposures.

SACR portfolio by risk weightings The risk weightings determined by external ratings or flat risk weightings and the allocations of the exposures to these risk weightings are shown below. The table shows the SACR exposures before and after credit risk mitigation (CRM) according to part 3 title II chapter 4 CRR.

Table 16: Exposures in the Standard Approach to Credit Risk before credit risk mitigation

	Risk weightings (RW)[1]											
Asset class €m	**0%**	**2%**	**10%**	**20%**	**35%**	**50%**	**75%**	**100%**	**150%**	**250%**	**Other RW**	**Total**
Central gov. or central banks	48,392	0	0	0	0	206	0	0	0	0	0	48,598
Regional gov. or local authorities	17,308	0	0	7,203	0	397	0	39	0	0	0	24,947
Public-sector entities	8,513	0	0	1,745	0	25	0	1	0	0	0	10,284
Multilateral development banks	354	0	0	0	0	0	0	0	0	0	0	354
International organisations	345	0	0	0	0	0	0	0	0	0	0	345
Institutions	465	2,769	0	2,339	0	214	0	3	0	0	0	5,790
Corporates	0	1,832	0	331	0	1,360	0	5,787	0	0	0	9,309
thereof SMEs	0	0	0	0	0	90	0	531	0	0	0	622
Retail	0	0	0	0	0	0	1,345	0	0	0	0	1,345
thereof SMEs	0	0	0	0	0	0	55	0	0	0	0	55
Secured by mortgages on immovable property	0	0	0	0	1,303	178	0	0	0	0	0	1,481
thereof SMEs	0	0	0	0	0	0	0	0	0	0	0	0
Defaulted positions	0	0	0	0	0	0	0	50	340	0	0	390
Particularly high risk exposures	0	0	0	0	0	0	0	0	35	0	0	35
Covered bonds	0	0	0	100	0	0	0	0	0	0	0	100
Collective investment undertakings	0	0	0	0	0	0	0	224	0	0	531	755
Other items	0	0	0	0	0	0	0	289	0	2,666	0	2,955
Equity exposures	0	0	0	0	0	0	0	595	0	245	0	840
Total 2016	**75,378**	**4,601**	**0**	**11,718**	**1,303**	**2,380**	**1,345**	**6,987**	**375**	**2,911**	**531**	**107,530**
Total 2015	67,019	4,622	0	14,955	1,236	3,305	1,432	11,959	539	2,924	489	108,480

[1] No positions in RW 70%.

Table 17: Exposures in the Standard Approach to Credit Risk after credit risk mitigation

	Risk weightings (RW)[1]											
Asset class €m	**0%**	**2%**	**10%**	**20%**	**35%**	**50%**	**75%**	**100%**	**150%**	**250%**	**Other RW**	**Total**
Central gov. or central banks	53,359	0	0	19	0	221	0	0	0	0	0	53,600
Regional gov. or local authorities	18,124	0	0	7,361	0	397	0	39	0	0	0	25,921
Public-sector entities	8,828	0	0	1,583	0	10	0	1	0	0	0	10,423
Multilateral development banks	413	0	0	0	0	0	0	0	0	0	0	413
International organisations	345	0	0	0	0	0	0	0	0	0	0	345
Institutions	466	2,769	0	2,061	0	241	0	3	0	0	0	5,541
Corporates	0	1,832	0	337	2	1,037	0	5,192	0	0	0	8,400
thereof SMEs	0	0	0	0	0	5	0	421	0	0	0	425
Retail	0	0	0	0	0	0	1,204	0	0	0	0	1,204
thereof SMEs	0	0	0	0	0	0	50	0	0	0	0	50
Secured by mortgages on immovable property	0	0	0	0	1,303	178	0	0	0	0	0	1,481
thereof SMEs	0	0	0	0	2	18	0	0	0	0	0	20
Defaulted positions	0	0	0	0	0	0	0	34	333	0	0	367
Particularly high risk exposures	0	0	0	0	0	0	0	0	35	0	0	35
Covered bonds	0	0	0	100	0	0	0	0	0	0	0	100
Collective investment undertakings	0	0	0	0	0	0	0	224	0	0	531	755
Other items	0	0	0	0	0	0	0	289	0	2,666	0	2,955
Equity exposures	0	0	0	0	0	0	0	595	0	245	0	840
Total 2016	**81,535**	**4,601**	**0**	**11,461**	**1,306**	**2,084**	**1,204**	**6,377**	**368**	**2,911**	**531**	**112,379**
Total 2015	75,359	4,622	0	14,442	1,238	2,006	1,251	8,998	533	2,924	489	111,862

[1] No positions in RW 70%.

In order to mitigate credit risk in the SACR, the Commerzbank Group takes financial collateral and guarantees into consideration. These will be dealt with separately in the section risk mitigation. Furthermore, collateral in the form of property charges also reduces the risk weighting.

To determine the SACR exposure before credit risk mitigation, the nominal value before credit risk mitigation is multiplied by the respective SACR conversion factor in accordance with Article 111 CRR. The risk exposure after credit risk mitigation corresponds to the value of the exposure reduced by the amount of the collateral value taking into account the conversion factors. For the SACR risk exposure, in contrast to the IRBA, the valuation allowances based on each of the positions are deducted.

Under the SACR, guarantees are treated according to the substitution principle. This means that the borrower's risk weighting is replaced by that of the guarantor. Consequently, the guaranteed amount is transferred from the borrower's exposure class to that of the guarantor. However, this shift only takes place if the risk weighting of the guarantor is lower than that of the borrower. This is why the exposure before CRM for assets guaranteed by central governments and central banks, for example, is less than after CRM. This can be seen in the table under the 0% risk weighting.

Past due positions are shown with a risk weighting of 150%. Depending on the valuation allowances based on them (SLLP, Port LLP impaired) or the collateral, a risk weighting of 100% can be applied or they may be shifted to another exposure class.

The following table shows the scope of the credit risk mitigation effects of financial collateral, guarantees, life insurances, credit derivatives and mortgage liens under the SACR. The effectively secured risk exposures, i.e. taking into consideration all of the relevant haircuts for the collateral, are allocated to the SACR exposure class. In taking financial collateral into account as a credit risk mitigation technique, Commerzbank generally uses the comprehensive method as defined under Articles 223 to 228 CRR. In doing so, the risk exposure value for the default risk position is reduced by the value of the financial collateral.

Table 18: Collateralised SACR risk exposures[1]

Asset class €m	Financial collateral	Guarantees	Life insurances	Credit derivatives	Mortgage liens	Total
Central governments or central banks	0	0	0	0	0	0
Regional governments or local authorities	1	22	0	0	0	23
Public-sector entities	1	212	0	0	0	212
Institutions	238	56	0	0	0	294
Corporates	618	316	6	0	197	1,137
thereof SMEs	92	90	0	0	16	199
Retail	111	27	3	0	1,284	1,424
thereof SMEs	2	0	0	0	4	6
Secured by mortgages on immovable property	0	0	0	0	0	0
thereof SMEs	0	0	0	0	0	0
Defaulted positions	1	21	0	0	22	43
Total 2016	**970**	**653**	**9**	**0**	**1,503**	**3,134**
Total 2015	803	4,447	16	0	1,702	6,969

[1] For reasons of materiality, secured investment positions are not presented.

The secured positions shown under mortgage liens are the exposures that are allocated to the SACR exposure class "Exposures secured by immovable property". For the purposes of comparability with the figures shown under the IRBA, this exposure class is not presented separately; exposures secured by immovable property are instead classified according to the borrower's exposure class.

Overarching portfolio analyses

This section provides an overview of the total portfolio containing default risks with an assessment basis[1] amounting to €524bn as at 31 December 2016.

We show the sum of SACR and IRBA positions with their assessment basis (risk exposure value), as defined in Articles 111 ff. and 151 ff. CRR. The IRBA assessment basis for loans is the amount claimed by the customer. Unlike with the volume of assets determined in accordance with IFRS accounting standards, valuation allowances are not deducted. Off-balance-sheet positions relate to the amount committed to but not yet claimed by the customer. They are not weighted with the conversion factor. For securities, the IRBA assessment basis is determined as the higher of the acquisition costs or the sum of the carrying amount and default risk-related write-downs. For derivative positions, the credit equivalent amount as defined in Article 271 ff. CRR is applied. The SACR assessment basis is calculated using the IFRS carrying value of the positions, taking into account the write-downs in the last approved annual financial statements. The assessment basis includes all positions subject to credit risks, regardless of whether the positions are listed in the banking or the trading book.

Effectively securitised positions are not included in the tables below. In accordance with Articles 243 and 244 CRR, positions are deemed to be effectively securitised if there has been an effective and operative transfer of risk. This applies regardless of whether these are traditionally or synthetically securitised positions. Securitisation positions arising from Group companies included in this Disclosure Report acting as investors or sponsors have also not been shown. Due to their particular significance, these are shown in the separate chapter on securitisations.

Other non-loan-related assets and other items, respectively, are only listed when they are characterised as claims. These are mainly cash items in the process of collection and accrued items. Other non-loan-related assets which are largely formed through tangible assets as well as other positions which are not characterised as claims are not included in the following tables. Only positions that are exposed to credit risks are shown.

[1] Original risk position before applying conversion factors.

The selected country clusters correspond to the geographical classification of the assessment basis used for internal purposes.

Table 19: Assessment basis by country cluster (independent of segment classification)

Asset class €m	Germany	Western Europe (without Germany)	Central and Eastern Europe	North America	Asia	Other	Total
SACR							
Central governments or central banks	20,918	17,877	9,633	220	0	5	48,653
Regional governments or local authorities	16,358	6,504	227	2,625	146	0	25,860
Public-sector entities	9,572	981	29	22	0	0	10,605
Multilateral development banks	0	81	0	0	0	273	354
International organisations	0	0	0	0	0	345	345
Institutions	3,936	1,072	27	4	0	752	5,791
Corporates	2,499	4,160	2,393	770	19	111	9,952
thereof SMEs	151	90	521	0	0	0	762
Retail	4,273	46	896	5	10	5	5,235
thereof SMEs	121	0	9	0	0	0	131
Secured by mortgages on immovable property	202	6	1,282	0	0	0	1,490
thereof SMEs	39	0	0	0	0	0	40
Defaulted positions	101	238	194	20	11	0	564
Positions of particularly high risk	35	0	0	0	0	0	35
Covered bonds	0	100	0	0	0	0	100
Institutions/corporates with short-term credit assessment	0	0	0	0	0	0	0
Collective investment undertakings	755	0	0	0	0	0	755
Other items	2,608	85	128	0	0	0	2,821
Total SACR	**61,259**	**31,150**	**14,809**	**3,666**	**187**	**1,491**	**112,561**
IRBA							
Central governments or central banks	79	4,539	350	3,951	10,859	2,392	22,170
Institutions	6,758	22,845	2,943	5,532	11,585	6,898	56,561
Corporates	105,293	64,664	12,954	19,200	8,020	4,030	214,161
thereof specialised lending	15,186	9,833	2,476	477	197	1,555	29,723
thereof SMEs	11,009	624	3,188	33	104	12	14,970
Retail	104,009	1,095	11,252	170	330	131	116,988
Secured by mortgages on immovable property	58,029	569	6,809	87	127	48	65,669
thereof SMEs	599	6	533	4	0	0	1,142
Qualifying revolving	12,463	112	18	24	32	33	12,682
Other	33,517	414	4,425	59	171	50	38,636
thereof SMEs	11,244	68	1,732	18	48	1	13,111
Other non credit-obligation assets	1,511	6	400	0	1	10	1,927
Total IRBA	**217,650**	**93,148**	**27,899**	**28,853**	**30,795**	**13,461**	**411,806**
Total 2016	**278,908**	**124,299**	**42,708**	**32,519**	**30,982**	**14,952**	**524,367**
Total 2015	263,828	135,377	43,227	33,857	30,225	19,543	526,057

The breakdown by sector is based on a system used internally and the methodology applied by the Federal Statistical Office.

Table 20: Assessment basis by sector

Asset class €m	Financial services	Manufacturing industry[1]	Public sector[2]	Other services[3]	Private households	Other	Total
SACR							
Central governments or central banks	3,084	0	44,944	0	626	0	48,653
Regional governments or local authorities	0	68	25,476	281	21	14	25,860
Public-sector entities	4,233	95	4,792	1,482	0	3	10,605
Multilateral development banks	354	0	0	0	0	0	354
International organisations	0	0	345	0	0	0	345
Institutions	5,786	1	0	4	0	0	5,791
Corporates	4,375	1,066	610	3,295	486	120	9,952
thereof SMEs	172	139	0	299	139	13	762
Retail	22	81	0	379	4,743	11	5,235
thereof SMEs	1	12	0	81	36	0	131
Secured by mortgages on immovable property	14	21	0	168	1,280	7	1,490
thereof SMEs	1	0	0	39	0	0	40
Defaulted positions	258	127	9	102	64	5	564
Positions of particularly high risk	35	0	0	0	0	0	35
Covered bonds	100	0	0	0	0	0	100
Institutions/corporates with short-term credit assessment	0	0	0	0	0	0	0
Collective investment undertakings	755	0	0	0	0	0	755
Other items	67	3	2,666	86	0	0	2,821
Total SACR	**19,084**	**1,460**	**78,842**	**5,795**	**7,219**	**160**	**112,561**
IRBA							
Central governments or central banks	15,197	18	6,897	56	1	1	22,170
Institute	49,054	631	5,895	979	0	1	56,561
Corporates	16,921	113,932	2	80,943	1,197	1,166	214,161
thereof specialised lending	1,919	8,857	0	18,707	113	127	29,723
thereof SMEs	793	7,090	0	6,624	295	169	14,970
Retail	1,172	7,357	0	19,639	88,331	488	116,988
Secured by mortgages on immovable property	666	1,374	0	8,244	55,203	182	65,669
thereof SMEs	9	28	0	568	534	3	1,142
Qualifying revolving	0	0	0	0	12,682	0	12,682
Other	506	5,983	0	11,395	20,445	306	38,636
thereof SMEs	170	5,174	0	6,531	1,057	179	13,111
Other non credit-obligation assets	3	113	14	1,214	583	0	1,927
Total IRBA	**82,346**	**122,051**	**12,808**	**102,832**	**90,112**	**1,657**	**411,806**
Total 2016	**101,430**	**123,511**	**91,650**	**108,627**	**97,331**	**1,817**	**524,367**
Total 2015	108,775	124,541	87,450	113,685	89,629	1,977	526,057

[1] Including water supply.
[2] Public sector, defence and social security.
[3] Amongst others commerce, transport, corporate and personal related services.

The breakdown according to residual term is based on maturity. Overnight receivables include call and overnight transactions and credit lines that can be terminated at any time.

Table 21: Assessment basis by time to maturity

Asset class | €m	Due on demand	>1 day to 3 months	>3 months to 1 year	>1 year to 5 years	Over 5 years	Total
SACR						
Central governments or central banks	20,866	1,832	2,056	11,023	12,877	48,653
Regional governments or local authorities	940	662	1,205	7,347	15,707	25,860
Public-sector entities	177	2,947	2,326	3,711	1,444	10,605
Multilateral development banks	0	0	0	81	273	354
International organisations	0	0	25	320	0	345
Institutions	2,012	2,306	395	740	337	5,791
Corporates	2,853	909	612	1,496	4,081	9,952
thereof SMEs	95	52	133	288	194	762
Retail	4,603	19	78	99	436	5,235
thereof SMEs	30	1	24	5	71	131
Secured by mortgages on immovable property	728	5	8	51	698	1,490
thereof SMEs	0	0	0	9	30	40
Defaulted positions	247	7	12	49	250	564
Particularly high risk positions	35	0	0	0	0	35
Covered bonds	0	0	100	0	0	100
Institutions/corporates with short-term credit assessment	0	0	0	0	0	0
Collective investment undertakings	0	0	0	0	755	755
Other items	69	0	0	0	2,752	2,821
Total SACR	**32,531**	**8,686**	**6,817**	**24,917**	**39,611**	**112,561**
IRBA						
Central governments or central banks	13,729	763	1,267	3,625	2,786	22,170
Institutions	8,727	7,720	13,591	14,626	11,897	56,561
Corporates	52,539	17,954	26,149	79,855	37,663	214,161
thereof specialised lending	2,995	627	3,496	9,622	12,984	29,723
thereof SMEs	4,163	1,318	2,281	3,536	3,672	14,970
Retail	28,043	1,675	5,412	10,371	71,487	116,988
Secured by mortgages on immovable property	189	250	1,170	4,372	59,689	65,669
thereof SMEs	3	2	9	83	1,046	1,142
Qualifying revolving	12,671	5	4	3	0	12,682
Other	15,183	1,420	4,239	5,996	11,799	38,636
thereof SMEs	9,072	637	964	1,406	1,032	13,111
Other non credit-obligation assets	1,615	0	0	0	312	1,927
Total IRBA	**104,653**	**28,111**	**46,420**	**108,477**	**124,145**	**411,806**
Total 2016	**137,184**	**36,797**	**53,236**	**133,394**	**163,756**	**524,367**
Total 2015	122,341	36,039	60,699	133,205	173,773	526,057

Table 54 in the Appendix provides an overview of the average assessment basis during the reporting period by exposure class over the four quarters of 2016.

Default risks arising from derivative positions

In addition to market risks, derivative positions also give rise to default risks when a claim arises against the counterparty in the form of positive market values.

Commerzbank also looks at what is known as correlation risk (wrong way risk). This occurs when a counterparty's exposure and credit quality (rating) are negatively correlated. Wrong way risk is therefore an additional risk source, as the exposure is generally measured independently from the counterparty's creditworthiness. Commerzbank has a clear definition of specific and general wrong way risk. There are guidelines to assist in identifying and quantifying wrong way risk. They also set out how the exposure must be adjusted to allow for the wrong way risk. In the case of secured transactions, the potential relationship between the performance of the collateral and the credit rating of the counterparty also has to be considered and captured according to the Commerzbank collateral matrix.[1]

The derivative positions shown in the tables below do not include securitisation positions as defined in the CRR as these are shown in the securitisations chapter. This means that interest rate and currency swaps or credit derivative transactions entered into with special-purpose securitisation companies are not included.

Table 22: Positive replacement values by risk type before/after netting/collateral

	Replacement values	
Risk type | €m	**2016**	**2015**
Interest rate risk	103,970	119,317
Currency risk	14,872	14,993
Equity risk	3,297	3,094
Precious metal risk	94	151
Commodity price risk	832	2,710
Credit derivatives	2,244	2,344
Collateral	27,837	22,489
Replacement values before netting/collateral	**153,146**	**165,098**
Nettable value	124,292	132,406
Eligible collateral	14,464	16,077
Replacement values after netting/collateral	**14,391**	**16,615**

The positive market values listed in the table are the expenses which would be incurred by the Bank to replace the contracts originally concluded with transactions of an equivalent financial value. From the Bank's point of view, a positive market value thus indicates the maximum potential counterparty-specific default risk. The positive market value is understood as a replacement value in the regulatory sense. The amounts shown in the table reflect the positive replacement values before taking related collateral into account and before exercising offsetting agreements. The replacement values are broken down according to risk types in the contracts involved. The collateral provided for derivative positions is shown as a separate risk type as it cannot be allocated to specific other risk types.

The replacement values arising from equity risk relate to the derivative default risk positions from financial instruments of risk type equity pursuant to Article 4 (50) c) CRR and do not take the rules for embedded derivatives pursuant to IAS 39 into account.

The proportion of derivatives processed via a central counterparty was 42% as at the end of the year.

In order to minimise both the economic and the regulatory credit risk arising from these instruments, Commerzbank concludes master agreements (bilateral netting agreements) such as the 2002 ISDA Master Agreement or the German Master Agreement for Financial Futures with the respective business partners. By means of such bilateral netting agreements, the positive and negative fair values of the derivatives contracts included under a master agreement can be offset against one another, and the future regulatory risk add-ons for these products can be reduced. This netting process reduces the credit risk to a single net claim on the contracting party (close-out netting).

[1] Although in a regulatory context wrong way risk is normally mentioned in connection with counterparty risk, Commerzbank also considers it in connection with issuer risk (e.g. between the issuer of a bond and the guarantor).

For both regulatory reports and the internal measurement and monitoring of credit commitments, these risk-mitigating techniques are only used if Commerzbank considers them enforceable in the jurisdiction in question, should the counterparty become insolvent. Legal opinions are obtained from various international law firms in order to verify enforceability.

Similar to the master agreements are the collateral agreements (e.g. collateralisation annex for financial futures contracts, Credit Support Annex), which Commerzbank concludes with its business partners to secure the net claim or liability remaining after netting (receipt or provision of collateral). As a rule, this collateral management reduces credit risk by means of prompt, usually daily or weekly, measurement and adjustment of the customer exposure. The – mostly cash – collateral and netting opportunities shown in the aforementioned table reduce the exposure to counterparties to €14,391m (2015: €16,615m).

The basis for determining the offset amounts for the default risk from derivative positions is not the positive market values but instead the credit equivalent values. To determine the assessment basis of derivative default risk positions, Commerzbank uses the internal model method (IMM) pursuant to Article 283 ff. CRR and the market valuation method pursuant to Article 274 CRR.

The approach to risk quantification under the IMM is generally based on a risk simulation which generates future market scenarios and creates portfolio valuations based on these scenarios. Netting and collateral agreements are taken into account.

In applying the internal model method, the EaD is defined per counterparty as the product of the alpha factor and the calculated effective expected positive exposure E*. Risks that are not taken into account when determining E*, correlation risks for example, are included in the capital adequacy calculation through the alpha factor. Banks can either estimate the alpha factor themselves or use the supervisory value of 1.4. Commerzbank does not estimate its own alpha factor, preferring instead to use the supervisory value to calculate exposure at default.

The credit equivalent values for the counterparty default risk from derivative positions – including exchange-traded derivatives – used to determine the (net) assessment basis amounted to €9,972m at the end of 2016 using the market valuation method and €15,526m using the internal model method. Credit equivalent values effectively correspond to the exposures of on-balance-sheet default risk positions, as a credit conversion factor of 100% is applied to derivative positions.

All operative units, branches and subsidiaries are, subject to compliance with the regulations, authorised to use credit derivatives to hedge credit risks in loan portfolios (i.e. purchase of hedges). This allows them to hedge credit risks with a credit derivative without having to sell or assign the loan.

Table 23: Breakdown of credit derivative business in the banking and trading book

	Banking book		Trading book	
Type of credit derivative Nominal value | €m	**Buy position**	**Sell position**	**Buy position**	**Sell position**
Credit Default Swap	3,980	2,892	25,063	27,906
Total Return Swap	0	0	1,370	0
Total 2016	**3,980**	**2,892**	**26,433**	**27,906**
Total 2015	5,048	3,725	34,282	32,822

Contractual agreements that oblige Commerzbank to provide additional collateral to its counterparties in the event of a downgrading of its own rating are governed in the Credit Support Annexes which are established as part of the netting master agreements for OTC derivative business.

The counterparty ratings (from Standard & Poor's, Moody's and FitchRatings) are automatically uploaded on a daily basis via interfaces with Reuters, Telerate or Bloomberg into the collateral management system, which can simulate downgrade scenarios if necessary. This makes it possible to carry out an advance analysis of the potential effects on the collateral amounts. Commerzbank regularly reviews these collateral amounts as part of its stress test assuming a simultaneous two-notch downgrade by the three big rating agencies.

The results of this stress test are shown in the table below:

Table 24: Additional contractual obligations

Additional contractual obligations | €m	
Contractual derivative outflows and margin calls	584
thereof collateralised interest rate derivatives	100
thereof uncollateralised interest rate derivatives	484
Other contractual outflows and margin calls	33
Total 2016	**617**
Total 2015	617

As part of the new regulatory requirements under Basel 3, since 2015 the Commerzbank Group has additionally calculated the capital requirements for credit value adjustments (CVA risk) according to Article 381 ff. CRR. For the portfolios of Commerzbank Aktiengesellschaft, CVA risk is calculated using the advanced method according to Article 383 CRR via a sensitivity-based approach. For the Group's subsidiaries, the standardised approach according to Article 384 CRR is applied. As at 31 December 2016 there were eligible hedges according to Article 386 CRR: iTraxx senior financials of €508m and single name CDS of €94m. The capital requirements for CVA risk amounted to €493m (€6,160m RWA) as at 31 December 2016 for the Group.

Loan loss provisions for default risks

Responsibility for processing non-performing loans for the core business segments PSBC and CC lies with Group Intensive Care, while Group Credit Risk Management Non Core is responsible for the ACR segment. These two divisions bring together the specific expert knowledge needed to support customers undergoing restructuring and to successfully process terminated commitments including collateral realisation.

The lending risks reported under the IFRS category LaR (loans and receivables) are taken into account by forming specific loan loss provisions (SLLP), portfolio loan loss provisions (PLLP) and general loan loss provisions (GLLP) for on- and off-balance-sheet claims on the basis of the rules and regulations according to IAS 37 and IAS 39.

When determining loan loss provisions, the fundamental criteria include whether the claims are in default or not and whether the claims are insignificant (exposure up to €5m) or significant (exposure over €5m).

All claims which are in default under the Basel regulations are defined as in default or non-performing. The following events are decisive in determining the default of a customer:

- Imminent insolvency or over 90 days past due.
- The Bank is assisting in the financial rescue measures of the customer with or without restructuring contributions.
- The Bank has demanded repayment of its claim.
- The customer becomes insolvent.

A portfolio loan loss provision (PLLP impaired) is recognised for insignificant defaulted claims using internal parameters. For significant defaulted claims, the net present value of the expected future cash flows is used to calculate both specific valuation allowances and specific loan loss provisions (SLLP). The cash flows include both the expected payments and the expected proceeds from realising collateral and other recoverable cash flows. The loan loss provision is equal to the difference between the claim amount and the net present value of all the expected cash flows. The general loan loss provision (GLLP and PLLP non-impaired) for on-balance-sheet and off-balance-sheet transactions is calculated at individual transaction level using internal default parameters (PD, LGD) and taking the LIP factor into account (LIP = loss identification period). Country risks are not accounted for separately under IFRS but are included for the purposes of the SLLP calculation in the individual cash flow estimates and given a lump-sum value in the LGD parameters when calculating portfolio loan loss provisions.

Impairment tests are also performed for securities classified as available for sale (AfS) and loans and receivables (LaR) if the fair value is below the amortised acquisition costs due to the credit rating. A review is conducted at each balance sheet date to determine whether there is objective evidence (trigger event) of impairment and whether this case of loss will have an impact on the expected cash flows. The trigger event review is based on the creditworthiness of the borrower/issuer or the issue rating, e.g. for Pfandbriefe (German covered bonds) and ABS transactions. Trigger events may include:

- Past due/default in payments of interest or principal on the part of the issuer/borrower.
- Restructuring of the debt instrument due to significant financial difficulties on the part of the issuer (of a security) or debtor (of a loan).
- Increased probability of a restructuring procedure.
- Increased probability of insolvency.

The trigger events are operationalised through a combination of rating and fair value changes. To achieve this, the individual securities are split into three groups (listed and unlisted equity instruments and debt instruments) that form the basis for further individual impairment reviews. If trigger events are found, an impairment is recognised in the income statement and the corresponding claim is deemed to be non-performing. For AfS positions, if no trigger event is found but the fair value is below the amortised acquisition cost, the revaluation reserve is charged. The impairment amount is determined from the difference between the amortised acquisition cost and the fair value.

The total amount of the loan loss provisions, insofar as they relate to claims on the balance sheet, is deducted from the respective balance sheet items. Provision for risks in off-balance-sheet business – guarantees, endorsement liabilities, lending commitments – is shown as other provisions for specific/portfolio risks in lending business.

In accordance with the Group's write-down policy, impaired positions are written down to the net present value of the claim two years after the notice of termination using existing loan loss provisions and valuation allowances (SLLPs/PLLPs impaired). Amounts recovered on claims written down are recognised in the income statement.

The tables below on loan loss provisions show the total amount of non-performing claims or those past due in the IFRS category LaR, including the related loan loss provisions with the corresponding write-downs grouped by sector and country of residence of the respective borrower.

Past due claims refer to all claims that are in arrears by at least one day up to 90 days and are not defined as loans in default under consideration of the minimum threshold (2.5% of the limit or €100).

The table below sets the total on-balance-sheet and off-balance sheet claims from non-performing and past due claims against the loan loss provisions, net allocations and direct write-downs. The following definitions are used here:

- SLLP on-balance is the sum of specific loan loss provisions for significant claims, determined on the basis of individual cash flow estimates.
- PLLP impaired on-balance is the sum of portfolio loan loss provisions for insignificant non-performing claims, determined on the basis of internal risk parameters per portfolio.
- SLLP and PLLP impaired off-balance is the total sum of provisions for significant and insignificant off-balance sheet claims. These provisions are determined in the same way as for on-balance sheet claims.
- GLLP/PLLP non-impaired (NI) on-/off-balance is the sum of general loan loss provisions relating to past due claims.

The net additions column shows the net position from additions and reversals of loan loss provisions for on-balance-sheet and off-balance-sheet transactions. This does not include direct write-downs and recoveries on written-down assets. These are shown separately in the columns Direct write-ups/-downs and Recoveries on written-down assets.

Table 25: Non-performing and past-due loans by sector

Sector €m	Non-performing loans	SLLP on-balance (SCRA)	PLLP impaired on-balance (SCRA)	SLLP+PLLP impaired off-balance (SCRA)	Direct write-up/ -downs
Agriculture and forestry	63	20	5	0	0
Fisheries	1	0	0	0	0
Mining and quarrying of stone	49	34	0	0	0
Manufacturing industry	1,313	705	109	26	76
Energy and water supply	178	73	4	1	2
Construction	322	153	23	17	4
Trade, maintenance and repair of motor vehicles and consumer goods	613	203	102	11	42
Hotels and restaurants	29	3	7	0	1
Transport and communication	1,745	719	17	14	24
Banking and insurance	530	379	13	0	20
Real estate[1]	942	283	54	5	25
Public sector[2]	95	59	0	0	0
Education and training	10	2	1	0	0
Health, veterinary and social work	19	1	5	0	9
Other public and personal service activities	147	53	17	1	3
Private households	823	61	337	1	32
Non-profit organizations	7	0	2	0	0
Total 2016	**6,884**	**2,748**	**696**	**76**	**237**
Total 2015	8,011	3,178	640	105	434

[1] Including the rental of movable property and business service deliveries. [2] Including defence and social security

Table 25 continued: Non-performing and past-due loans by sector

Sector €m	Past due loans	GLLP/PLLP NI on-/off-balance for past due loans	Net additions	Recoveries on written-down assets
Agriculture and forestry	12	0	2	3
Fisheries	0	0	0	0
Mining and quarrying of stone	159	1	–4	2
Manufacturing industry	575	3	81	62
Energy and water supply	82	3	5	7
Construction	53	1	15	10
Trade, maintenance and repair of motor vehicles and consumer goods	397	2	21	29
Hotels and restaurants	19	0	0	0
Transport and communication	617	23	657	23
Banking and insurance	2,093	3	–29	10
Real estate[1]	459	10	56	35
Public sector[2]	6	9	0	0
Education and training	2	0	–1	0
Health, veterinary and social work	32	0	–17	1
Other public and personal service activities	59	0	30	6
Private households	542	12	–14	14
Non-profit organizations	3	0	0	0
Total 2016	**5,110**	**69**	**803**	**200**
Total 2015	6,179	99	699	245

[1] Including the rental of movable property and business service deliveries. [2] Including defence and social security.

Commerzbank bases its definition of the total sum of non-performing and past due claims on its accounting. Pursuant to Art. 315a (1) of the German Commercial Code, the Commerzbank Group issues Group financial statements based on International Financial Reporting Standards (IFRS). For this reason, the book values according to IFRS are applied for the total amount of non-performing and past due claims. Credit risk mitigation techniques which can mitigate risks for the purposes of determining the capital requirement are not relevant for the determination of the claim amount for accounting procedures.

The total non-performing and past due claims amount to €12.0bn, of which €6.9bn is attributable to the default portfolio (non-performing loans) and €5.1bn is attributable to past due loans. In addition to the loan loss provisions presented below, collateral value is also held against the total non-performing claims and taken into account accordingly in the calculation of the SLLP, PLLP and GLLP. The amounts recovered on written-down claims amounting to €200m are booked as income in the loan loss provisions.

Table 26: Non-performing and past-due loans by country cluster

Country cluster €m	Non-performing loans	SLLP on-balance	PLLP impaired on-balance (SCRA)	SLLP+PLLP impaired off-balance (SCRA)	Direct write-up/ -downs	Past due loans	GLLP/PLLP NI on-/off-balance for past due loans
Germany	3,373	1,114	378	61	185	3,351	23
Western Europe (excl. Germany)	1,246	667	11	2	25	607	26
Central and Eastern Europe	1,332	389	305	4	12	575	11
North America	67	46	0	0	0	34	3
Asia	187	92	1	0	9	193	0
Other	680	439	1	10	6	350	6
Total 2016	**6,884**	**2,748**	**696**	**76**	**237**	**5,110**	**69**
Total 2015	8,011	3,178	640	105	434	6,179	99

The breakdown by country cluster reflects the Commerzbank Group's focus on Germany and selected markets throughout Europe. This means that the vast majority of the loan loss provisions are attributable to borrowers based in these regions.

The tables below only show the development of loan loss provisions relating to the lending business. Only claims or loan commitments under the IFRS category LaR and their corresponding loan loss provisions are included in the tables. Write-downs on securities are not recognised in loan loss provisions but in net investment income. Note 36 to the Group financial statements in the Annual Report 2016 provides more details on this.

Table 27: Development of loan loss provision in 2016

Type of provision €m	Opening balance	Additions	Reversals	Utilisation	Exchange rate changes	Other changes	Closing balance
SLLP on-balance (SCRA)	2,557	1,179	429	952	22	–11	2,365
PLLP impaired on-balance (SCRA)	640	340	125	187	–11	40	696
SLLP+PLLP impaired off-balance (SCRA)	105	34	65	0	0	1	76
GLLP/PLLP NI on/off-balance	791	39	159	0	–7	0	665
Total	**4,093**	**1,591**	**778**	**1,139**	**5**	**31**	**3,802**

Table 28 shows the realised losses related to the lending business over the reporting period in detail. Losses incurred in the lending business refer to direct write-downs (net of write-ups) and the utilisation of valuation allowances for claims classified as IRBA positions according to the CRR. Amounts recovered on written-down claims reduce the realised loss.

In addition, table 29 shows the expected losses of the preceding period for the non-defaulted portfolio.

Table 28: Realised losses in the lending business 2016

Asset class €m	Utilisation of risk provision	Direct write-downs	Write-ups	Recoveries on written-down assets	Total
Central governments or central banks	0	0	0	0	0
Banks	12	10	0	8	13
Companies	832	153	3	128	854
thereof SMEs	52	12	0	10	54
thereof specialised lending	531	25	0	20	535
thereof other	249	117	3	98	265
Retail	150	72	2	58	162
thereof SMEs	134	62	2	51	143
thereof secured by mortgages on immovable property	14	9	0	7	17
thereof qualifying revolving	2	1	0	1	2
thereof other	0	0	0	0	0
Total 2016	**994**	**236**	**6**	**195**	**1,029**
Total 2015	1,882	521	14	226	2,163

Table 29: Expected and realised losses since 2014

Asset class €m	Expected loss as at 31.12.2015	Realised loss 2016	Expected loss as at 31.12.2014	Realised loss 2015	Expected loss as at 31.12.2013	Realised loss 2014
Central governments or central banks	34	0	29	0	27	0
Banks	123	13	147	97	133	2
Companies	998	854	960	1,834	979	1,346
thereof SMEs	66	54	61	87		0
thereof specialised lending	726	535	649	1,474		1,021
thereof other	206	265	251	273		325
Retail	221	162	252	232	246	223
thereof SMEs	61	143	67	80		0
thereof secured by mortgages on immovable property	87	17	97	62		76
thereof qualifying revolving	15	2	20	2		1
thereof other	58	0	68	88		146
Total	**1,375**	**1,029**	**1,388**	**2,163**	**1,384**	**1,571**

For the direct comparison of the realised loss to the expected loss it has to be considered that the realised loss comprises the utilisation of risk provisions and write-downs of defaulted assets across several reporting periods whereas the expected loss relates to a one-year horizon only.

Deviating from the Annual Report, the expected loss amounts reported in this Disclosure Report do not include SACR or securitisation positions. Also, due to the change to SACR (permanent partial use pursuant to Article 150 CRR) in 2009, the asset class Investments is not shown here.

Investments in the banking book

Investment risks or shareholder risks are potential losses arising from the provision of equity capital to investments as a result of a fall in their value. They can be caused by general market fluctuations or company-specific factors.

Composition of investments

Commerzbank's portfolio of holdings is broken down in accordance with its significance to business policy. The bulk of the investments held as financial assets (banking book) and holdings in consolidated companies are designed to further the Bank's business objectives by supporting business lines/segments in the Bank (segment-supporting investments) or by having a strategic management or service function for the Group as a whole (other strategic investments).

There are also other non-strategic investments, some of which are allocated to the Assets & Capital Recovery segment. A divestment concept is applied here, the aim of which is to optimise Commerzbank's market value, capital and income statement under appropriate market conditions.

Risk management

The investment risks are managed centrally as part of the ongoing management and monitoring of Commerzbank's holdings by the Group Development & Strategy department and locally by the segments. The central monitoring is primarily concentrated on the non-strategic investments, while the strategic investments that form part of the Bank's core business are controlled on a decentralised basis by the Commerzbank segments responsible for them. The strategic investments are mainly majority holdings.

Under the "three lines of defence" principle, aimed at protecting against undesirable risks and set out by Commerzbank in the overall risk strategy, the respective operational segments responsible therefore represent the first line of defence for investment risks, while Group Development & Strategy, as the area responsible for the investment risk strategy, represents the second line of defence.

Regulatory valuation of investments

The Commerzbank Group and accordingly the group companies included in the disclosure are, as IRBA banks as defined in Article 147 CRR, generally obliged to value investments in accordance with the IRBA rules. For investments entered into prior to 1 January 2008, Commerzbank has opted to apply grandfathering. These investment positions are temporarily excluded from the IRBA and treated in accordance with the SACR rules. They are given a risk weighting of 100%. The CRR also allows items to be permanently exempted from the IRBA. Since 31 December 2009 Commerzbank has applied the partial use option pursuant to section 70 sentence 1 no. 9b SolvV and Article 150 CRR, and uses the SACR permanently to value all investment positions which do not fall under the above-mentioned temporary grandfathering option. Investments that are associated with particularly high risk according to the definition under Article 128 CRR, such as private equity investments or venture capital investments, are recognised in the corresponding SACR asset class.

Commercial valuation and accounting

Investments and shares in the banking book comprise equity instruments classified as available for sale (AfS) and those reported in the financial statements as fully consolidated or using the equity method. All equity instruments not held in the trading portfolio are therefore accounted for in this category.

Investments classified as AfS are reported at their fair value if it is available. Differences between historic costs and fair value are reported as equity capital without effect on net income. Equity instruments that are unlisted or listed but not actively traded are recognised at historic cost if their fair value is not reliably determinable.

Listed investments are continuously monitored with regard to their market price development. External analysts' opinions and share price forecasts (consensus forecasts) are included in the risk assessment. Listed holdings are monitored by means of impairment tests carried out at least quarterly by Group Finance in accordance with the impairment policy and tested for any significant qualitative or quantitative indicators (trigger events) of impairment. As soon as there are any indications of significant or lasting impairment, unrealised losses are written down.

Risks arising from unlisted holdings are subject to regular monitoring involving a database-supported year-end valuation, a monitoring of trigger events for relevant holdings to each balance sheet reporting date and special monitoring of investments classified as critical. Various valuation methods (e.g. capitalised earnings value, net asset value, liquidation value) are used to quantify the risks, depending on the book value, status (e.g. active, inactive, in liquidation) and type of business activity (e.g. operational, property holding company, holding) of the investment. If the intention is to sell the investment, it will be written down, if necessary, to a lower expected selling price; any appreciation in value would be reported in the revaluation reserve without effect on net income. For companies valued using the equity method, the valuation is equal to the proportionate IFRS equity capital.

Quantitative information on investments

This section covers investments as defined in Article 112 p) CRR. This means that only equity investments that are not consolidated for regulatory purposes but relate to the companies covered by this report are shown. The definition of an investment in CRR is wider than the usual accounting definition. For example, shares in limited companies (GmbHs), profit-sharing certificates with equity characteristics, promissory notes and derivative positions whose underlying is an investment position have to be classified as investments for regulatory purposes. Classical forms of investments nevertheless make up the majority of this CRR asset class.

The table below shows the book value and fair value of the investment instruments under IFRS as reported in the financial statements for the investment groups relevant to the Group's objectives and strategy.

Table 30: Valuation of investment instruments

	Book value (IFRS)		Fair value		Market value (listed positions)	
Investment group | €m	**2016**	**2015**	**2016**	**2015**	**2016**	**2015**
Segment-supporting investments	**448**	**454**	**448**	**457**	**5**	**5**
thereof listed positions	2	2	2	5	5	5
thereof unlisted positions	445	452	445	452	0	0
Other strategic investments	**35**	**141**	**35**	**141**	**0**	**0**
Other investments	**358**	**162**	**358**	**162**	**0**	**0**
Funds and certificates	**0**	**0**	**0**	**0**	**0**	**0**
Investments total	**840**	**757**	**840**	**759**	**5**	**5**

For listed positions the market value is given as well. For listed investments the book value under IFRS is their historic costs. Differences between book value under IFRS and fair value of listed investments result from the revaluation reserve.

For unlisted companies the book values under IFRS are used as fair value. Special purpose vehicles (SPVs) are not shown as they are not investments pursuant to regulatory definitions. The positions shown under Other strategic investments are exclusively unlisted positions. Only €0.2m of the Other investments are listed positions. All unlisted positions are classified as adequately diversified investment portfolios.

Shares in investment funds are allocated to the investment group Funds and certificates if the precise composition of the investment fund is not known and an average risk weighting supplied by the investment company is not used for capital adequacy purposes. Only shares in investment funds that invest wholly or partly in investment instruments are relevant. Therefore, shares in investment funds that are solely invested in fixed-income securities (e.g. bond funds) are not included here.

Table 31: Realised and unrealised profits/losses from investment instruments

		Unrealised revaluation profit/loss		
€m	**Realised profit/loss from sale/liquidation**	**Total**	**thereof accounted for in CET1 capital**	**thereof accounted for in Tier 2 capital**
2016	**114**	**102**	**102**	**0**
2015	106	141	141	0

Securitisations

Securitisation process

In securitisation business Commerzbank performs the three roles provided for in regulatory legislation, namely originator, sponsor and investor.

› **Originator** Parts of the Bank's own loan portfolio are placed selectively on the capital markets through securitisation transactions. The transfer of the credit risk is mainly by means of synthetic securitisations where the portfolio is hedged through financial guarantee contracts. During the year under review Commerzbank issued CoSMO Finance III-2, consisting of corporate and small and medium-sized business loans with a volume of €2bn. At Loan Solutions Frankfurt GmbH, the Semper Finance 2007-1 and Provide Gems 2002-1 transactions were repaid. Loan Solutions Frankfurt GmbH therefore no longer holds any securitisation items. As at the reporting date of 31 December 2016, out of the outstanding securitisations of Commerzbank Aktiengesellschaft, risk exposures of €5.7bn (securitised volume €6.1bn) were retained. By far the largest portion of these positions is accounted for by €5.6bn of senior tranches, which are nearly all rated good or very good. As at the reporting date, the Commerzbank Group's securitisation transactions placed on the capital markets and used to free up regulatory capital were as follows:

Table 32: Securitisation transactions with regulatory capital relief

Securitisation programme[2]	Type[1]	Securitisation pool	Maturity	Issue currency	Current volume | €m
CoSMO Finance III–1	S	Companies	2025	EUR	1,000
Coco Finance II–2	S	Companies	2025	EUR	3,000
CoSMO Finance III–3	S	Companies	2026	EUR	2,000
CB MezzCAP	T	Companies	2036	EUR	71
Total Commerzbank AG					**6,071**

[1] S = synthetic, T = True Sale.
[2] Securitisation of own customer receivables.

In addition, in recent years Commerzbank issued the SME Commerz SCB GmbH transaction (original volume €1.5bn), which does not qualify for capital relief for regulatory purposes. In the reporting year, due to the structure of the transactions Commerzbank did not hold any securitisation exposures for which additional capital was required as a result of an investor share to be taken into consideration by the originator under Articles 256 and 265 CRR. In addition, during the reporting year Commerzbank provided no non-contractual credit support within the meaning of Article 248 CRR. Where Commerzbank cooperated with rating agencies in connection with originator securitisation transactions (both synthetic and true sale), the agency in question was Moody's. The assets securitised by Commerzbank Aktiengesellschaft belong to the Bank and derive from its lending business with small and medium-sized business customers and from business with large customers. As part of the overall management of the Bank, the Commerzbank Group constantly reviews opportunities to securitise its own assets. This process is primarily influenced by the market conditions prevailing at any one time. The placement of a further synthetic securitisation of corporate loans with a volume of at least €1.5bn is planned for the first half of 2017.

› **Sponsor** By securitising their own portfolios of receivables, i.e. selling their receivables on a non-recourse basis, Commerzbank's customers are able to tap alternative sources of funding on the capital markets. Structuring, arranging and securitising these receivables portfolios, particularly those of customers in the Corporate Clients segment, is a key component of the structured finance product range. Special purpose vehicles (purchasing entities) are typically established to manage these assets. The purchases of receivables are funded primarily by the issue of short-term commercial papers (CPs) under the Bank's asset-backed commercial paper (ABCP) programme Silver Tower (conduit). The commercial papers issued are rated by Standard & Poor's, Moody's and FitchRatings. As sponsor, the Bank is responsible for structuring and, as a rule, purchasing and refinancing the transactions. Commerzbank provides the special purpose vehicles with liquidity facilities so that they have access to short-term liquidity. These liquidity facilities are counted in full when determining the risk-weighted exposures. The mainly high diversified portfolios of receivables generally derive from customers' working capital, such as trade receivables and car, machinery and equipment leases. The receivables portfolios therefore reflect the differing businesses of those selling the receivables. The volume in the Silver Tower conduit was increased by €0.9bn to €4.1bn in 2016. The securitisation exposures deriving from the Silver Tower conduit largely consist of liquidity facilities and back-up lines.

› **Investor** The Commerzbank Group invests under its regulatory banking book in securitisation positions. The Bank's internal credit risk strategy provides limited scope for entering into new securitisation positions provided that the risk profile of each securitisation position is subjected to a differentiated analysis and documentation. This allows transaction risk drivers that may impact directly or indirectly on the securitised position's risk content to be taken into account. In the year under review Commerzbank invested in senior-ranking securitisation positions, mainly backed by pools of corporate loans and consumer loans.

Risk Management

The internal processes for monitoring the risk profile of securitisation exposures are based on the provisions of Articles 406 and 408 CRR and on the principles of the Minimum Requirements for Risk Management (MaRisk) as amended. They apply equally to all securitisation exposures, irrespective of whether they are part of the regulatory trading or banking book, or whether Commerzbank acts as the originator, sponsor or investor.

The processes put in place by the Bank take account of the individual risk profile of securitisation exposures on the basis of a wide range of information sources. They ensure that various risks directly and indirectly affecting the probability of default of the securitised positions are monitored in a continuous and timely manner. This also includes carrying out regular stress tests that take account of macroeconomic factors and the individual risk profile of the securitised positions.

› **Originator** The credit process for loans to customers does not distinguish between loans which the Bank will securitise at a later date and those for which it will continue to assume the risk. Transactions which allow reliefs in capital for regulatory purposes are subject to a monitoring process that ensures the continuous compliance with the regulations on significant risk transfer according to Articles 243 and 244 CRR. The amount to be retained in securitisation transactions in accordance with Article 405 CRR is reviewed regularly and published in the Investor Report. A potential placement risk for Commerzbank's transactions is taken fully into account, as the receivables are included in full in the Bank's risk and capital management process up until the actual risk transfer by means of securitisation and placement.

› **Sponsor** The customer transactions funded via conduits are subject to an ongoing credit process. A risk analysis of the transactions is conducted when the transactions are structured and again in regular reviews which are carried out annually and as circumstances require. A rating is assigned using the ABS rating systems certified by the banking regulators (internal assessment approach). For this purpose we take into account all significant risk drivers of the securitised receivables portfolio (e.g. type of receivable, default rates, collateral provided, diversification, dilution risks, commingling risks) and of the securitisation structure (e.g. whether the creditor claims have a waterfall structure, credit enhancements). Qualitative risk drivers ascertained from regular on-site visits to the seller of receivables as well as the seller's financial position are also taken into account. For trade receivables, structure-inherent covers through credit insurance are taken into account in the rating model and credit analysis. Credit insurance is used in order to mitigate concentration risk. The main counterparties here are Euler Hermes Kreditversicherungs AG and the German branch of Coface S.A. Before any purchase of customer receivables, the minimum conditions agreed in the contract documentation are reviewed and any non-qualifying receivables are excluded. After the receivables have been bought, their quality is reviewed continuously. If any potential problems come to light another credit analysis of the structure is carried out.

› **Investor** Strict internal guidelines must be followed when acquiring a new securitisation position. Such positions are subject to a specific internal credit process that also ensures that the specific requirements for securitisation positions regarding due diligence and retention under Articles 405-406 CRR are met. In the credit process applied to the Bank's securitisation portfolio, the risk profile of the securitisation positions is analysed quarterly or as circumstances require. In preparing a credit assessment, at the level of the individual tranche a securitisation-specific rating system is used which has been developed internally within the Bank, while external standard models are also applied. In the case of resecuritisations, the analysis relates not only to the securitisation exposures contained in the pool but also covers the underlying portfolios on a risk basis (look-through principle). As with securitisation exposures, the ranking of the individual tranches contained in the pool within a securitisation structure are taken into account in this analysis, as are the specific features of the asset classes and of the different jurisdictions, in order to generate the expected aggregate cash flow. The results are then used to model the entire waterfall structure at the level of the resecuritisation.

Commerzbank takes into account not only the original default risk of the securitised receivables but also secondary risks such as market value risk, liquidity risk, legal risk and operational risk insofar as they are relevant with a direct or indirect impact on the default risk. This process looks, for example, at the performance reports for the securitised receivables, changes in external ratings and movements in the market value of the securitisation exposures.

When determining market price risk, changes relating to interest rates, foreign currency rates or credit spreads, among others, are taken into account for the risk assessment of each tranche. In addition, the combination of various conventional risk measures (e.g. VaR) ensures the appropriate management of market risk concentrations at Group level.

Liquidity risk refers in this context to the risk that Commerzbank will be unable to meet its payment obligations on a day-to-day basis. Liquidity risks from ABS transactions are modelled conservatively in the internal liquidity risk model. Firstly, a worst case assumption is made that Commerzbank has to take on virtually the entire funding of the purchase facilities provided to the special purpose vehicles under the Silver Tower conduit. Secondly, the Bank's holdings of securitisation transactions only qualify as liquid assets if they are eligible for rediscount at the European Central Bank. These positions are only included in the liquidity risk calculation after applying conservative discounts. With regard to the Silver Tower conduit, it is assumed not only that external refinancing of the conduit will be replaced by Commerzbank on expiry, but also that additional drawdowns on credit lines by customers of the conduit will have to be refinanced by Commerzbank.

Legal risk in the context of securitisation transactions is the risk that the Bank might suffer losses as a result of flaws in legal transaction structures or as a result of missing or flawed legal documentation. Commerzbank's independent Legal department is responsible for examining legal structures and all transaction contracts. In terms of content, risks are divided into those arising from the sphere of the originator itself or those directly connected with the portfolio to be securitised. The subsequent refinancing and collateral structure is also a key element of legal structuring and risk assessment.

As well as being associated with legal risk as a risk type under the overall heading of operational risk, securitisation business is subject to the Group-wide management of operational risks. It therefore falls within the framework of the certified advanced measurement approach used by Commerzbank to measure operational risks.

Regulatory valuation of securitisations

Securitisation positions in the banking book In the reporting period, Commerzbank applied the regulations of both the IRBA and the SACR for regulatory purposes.

› **Originator** The ratings-based approach is used for externally rated securitisation exposures that have been retained from the Commerzbank Group's own securitisation transactions. Capital is held against synthetic securitisation tranches that have been placed on the market based on the risk weighting of the party providing the collateral. Counterparties to the hedging instruments used, e.g. financial guarantees, are institutional investors, whose deposits serve as collateral, as well as multilateral development banks. For all synthetic transactions the supervisory formula approach (SFA) is used.

› **Sponsor** The overwhelming majority of sponsor transactions have to be allocated to the conduit business. Only in a few cases does Commerzbank hold other sponsor positions. Under the internal assessment approach (IAA), ABS rating systems certified by the supervisory authority are used for the Silver Tower conduit sponsored by Commerzbank. In the reporting period, we applied our own rating systems to the Silver Tower conduit for the following classes of receivables: trade receivables, car finance and leasing, equipment leasing and consumer lending. The rating systems are developed in accordance with the stipulations of regulatory requirements, independently of the front office, by Commerzbank's risk function. In accordance with the CRR, the methodology follows the guidelines of the rating agencies Standard & Poor's, Moody's and FitchRatings. The systems were certified at the outset by BaFin and the Bundesbank. They are subject to a regular review by the supervisors and internal audit. In addition, the internal assessment approach is subject to an annual validation by Commerzbank's risk function.

The various internal assessments take account of all features of the securitised receivables portfolio identified by the rating agencies as significant risk drivers as well as the specific structuring characteristics of the securitisation exposure. Other quantitative and qualitative risk components that are regarded as material by Commerzbank are also included in the assessment. These include, in particular, seller risks and qualitative risk drivers that are evaluated via structured qualitative questionnaires. The result of the rating process is a tranche-specific rating derived from the quantitative and qualitative results of the assessment approach. Depending on the specific approach used, this rating is based on the probability of default or expected loss (EL) of the securitised tranche. No external ratings from the above-mentioned rating agencies are available for the securitisation exposures subject to the internal assessment approach. The results of the internal assessment approach are used to determine regulatory capital requirements. They are also used within the internal capital model, in portfolio monitoring and in setting limits (ICAAP processes).

The approaches to modelling probability of default or expected loss (EL) for securitisation tranches differ depending on the type of securitised asset class. For the asset classes trade receivables, car finance and leasing, equipment leasing and consumer lending, a range of different stress factors used by the rating agencies are applied, depending on the main risk drivers for the relevant transactions. These are, for example, stress factors on concentration risks, default risks, dilution risks and interest rate risks. Quantitative and qualitative modelling components devised by the Bank are also used. When calculating loss buffers, stress factors are determined individually for different securitised asset types on the basis of the risk profiles of the securitisation transactions. In addition, in two cases the practice of making a capital deduction where no applicable external rating is available is used. Both the supervisory formula approach (SFA) and the look-through approach (LTA) are used in just a single case each.

› **Investor** For investor positions, external ratings are generally available and lead to the ratings-based approach (RBA) being applied. Commerzbank Aktiengesellschaft takes account of all available external ratings of securitisation positions issued by the rating agencies nominated by Commerzbank Aktiengesellschaft, namely Standard & Poor's, Moody's and FitchRatings. It does so irrespective of the type of receivables securitised and the type of securitisation exposure. A very small portion of investor positions is covered by guarantees from guarantors including the European Investment Fund (EIF). The guarantee is taken into account in the calculation of RWAs by substituting the risk weighting of the guarantor for the risk weighting of the securitisation. The look-through approach is used to a limited extent. In just a few cases a capital deduction is used due to the lack of an applicable external rating.

Companies which are consolidated within the Commerzbank Group for regulatory purposes may, as part of the Group-wide business and risk strategy, act as investors in securitisation transactions in which the Bank is acting as sponsor or originator.

Commerzbank Aktiengesellschaft currently only holds securitisation exposures from securitisation transactions where it acts as sponsor or originator. All retentions or repurchases of securitisation exposures from the Bank's own transactions with recognised regulatory risk transfer and securitisation exposures from transactions where Commerzbank has acted as sponsor are taken into account when determining the regulatory capital requirement. In the case of transactions without recognised regulatory risk transfer, the regulatory capital requirement is determined for the securitised portfolio.

Securitisation exposures in the trading book As at 31 December 2016, the majority of securitisation positions included in the trading book are hedged against performance-induced market price risks by means of credit default swaps with counterparties of good credit quality. In addition, further positions are allocated to the correlation trading book. The capital adequacy requirements are determined by application of the provisions of Articles 337 and 338 CRR relevant for securitisation exposures.

Valuation and accounting procedures
In true sale or synthetic securitisation transactions via special purpose vehicles, IFRS accounting regulations require the Bank to review whether or not the securitising special purpose vehicles need to be consolidated in accordance with IFRS 10. This review process is centralised in the Commerzbank Group in the accounting department. The central unit is informed of the establishment or restructuring of a special purpose vehicle. On the basis of the information submitted, it carries out a review to determine whether or not the special purpose vehicle needs to be consolidated

› **Originator** If the special purpose vehicle is consolidated as part of the Commerzbank Group, no further derecognition test is carried out under IAS 39 rules. The asset is not derecognised in this case. If the special purpose vehicle does not have to be consolidated, in true sale securitisations the possible derecognition of the securitised receivables from the balance sheet is assessed. Following an assessment of the risks and rewards of ownership as the primary derecognition criterion and the control concept as the secondary derecognition criterion (IAS 39.15 ff.), a derecognition or partial derecognition (continuing involvement) is reported where appropriate. In the case of synthetic securitisations, the underlying receivables remain on the balance sheet. As with securitised receivables in true sale securitisations that are not derecognised, they are reported in their original IFRS category. These receivables continue to be accounted for in accordance with the rules for this IFRS category. Where securitised receivables are derecognised, any resultant gains or losses are recognised in the income statement. In some cases, the derecognition of receivables may lead to the first-time recognition of new exposures, for example bonds issued by special purpose vehicles. Under IFRS these exposures are categorised on the basis of the intention with which the securities were acquired and the type of securities in one of the three IAS 39 categories (held for trading, loans and receivables or available for sale). Please refer to Note 5 to the IFRS Group financial statements for a detailed explanation of the classification rules and the related valuation procedures. No securitisation transactions leading to derecognition of receivables were carried out in the period under review. As a result, no gains or losses were realised from the sale of receivables in connection with securitisation transactions during the reporting period.

The securitising special purpose vehicles for the following transactions are currently consolidated for accounting purposes: Coco Finance II–2 Ltd. and SME Commerz SCB GmbH. However, these entities are not consolidated for regulatory purposes. CB MezzCap Limited Partnership is currently not consolidated either for accounting purposes or for the purposes of regulatory capital adequacy requirements. If assets are earmarked for securitisation, this has no direct impact on their accounting treatment or measurement within the applicable IFRS categories.

› **Sponsor** Under IFRS the funding entities Silver Tower Funding Ltd and Silver Tower US Funding LLC are not consolidated under Silver Tower. No purchasing entities are consolidated either. Moreover, no purchasing or funding entities are consolidated under Silver Tower for regulatory purposes. If a beneficiary special purpose vehicle is not consolidated under IFRS, the liquidity line provided to it is recorded in the notes to the Annual Report as a contingent liability in its full unutilised amount. Any utilised amount is recognised as a receivable in the IFRS category loans and receivables.

› **Investor** Under IFRS, investor positions are categorised on the basis of the intention with which the securities were acquired and the type of securities in one of the three IAS 39 categories (held for trading, loans and receivables or available for sale). For a detailed explanation, please refer to Note 5 to the IFRS Group financial statements, which also explains the related valuation procedures. If the securitisation exposures are traded on liquid markets with observable pricing, they are valued on the basis of independent market prices. If direct measurement at market prices is not possible, the value of the securitisation exposure is determined using prices from external providers. In some cases the value of the securitisation exposure is determined with the help of valuation models. This involves the application of a discounted cash flow approach, with the cash flows and other relevant parameters being based on data observable on the market. Moreover, the approach is calibrated with market data for application to similar securitisation structures. In many cases the prices estimated by external providers are used. There were no significant changes in the methods used to value securitisation positions in the period under review.

Quantitative information on securitisations

To provide a comprehensive overview of the Commerzbank Group's securitisation positions, the analyses shown in tables 33 to 39 comprise the complete group of companies consolidated for regulatory purposes.

Securitisation exposures in the banking book The following information relates to transactions for which risk-weighted exposures are determined in accordance with Articles 242–270 CRR. This also includes the Commerzbank Group's own securitisation transactions for which capital relief is available and made use of for regulatory purposes.

The total volume of all retained or acquired securitisation exposures (on- and off-balance-sheet) was €17.6bn as at the reporting date. This amount corresponds to the IRBA and SACR exposures after deducting eligible collateral.

A breakdown of retained or acquired securitisation exposures by exposure type and the regulatory role assumed by Commerzbank is given in the following table.

Table 33: Retained or acquired securitisation exposures in the banking book by type of exposure

	Originator		Investor		Sponsor	
€m	IRBA	SACR	IRBA	SACR	IRBA	SACR
Receivables[1]	5,643	0	13	0	776	0
Securities[2]	20	0	2,977	4,858	156	295
Other positions on-balance	0	0	0	0	0	0
Liquidity facilities	0	1	0	0	3,093	0
Derivatives[3]	0	0	29	93	0	0
Other positions off-balance[4]	0	0	0	0	16	0
Total 2016	**5,662**	**1**	**3,019**	**4,952**	**4,041**	**295**
Total 2015	3,762	1	3,104	5,535	3,124	365

[1] For example, drawdowns on liquidity facilities, cash loans, on-balance positions from synthetic transactions etc.
[2] ABS, RMBS, CMBS etc.
[3] Counterparty risk from market value hedges (interest rate and currency risks).
[4] Guarantees etc.

The table below provides a breakdown of the securitisation exposures shown above by type of underlying assets.

Table 34: Retained or acquired securitisation exposures in the banking book by type of asset

	Originator		Investor		Sponsor	
€m	IRBA	SACR	IRBA	SACR	IRBA	SACR
Loans to companies/SMEs	5,662	1	2,112	40	156	0
Commercial real estate	0	0	97	0	0	0
Residential real estate	0	0	21	486	0	0
Consumer loans	0	0	726	4,135	0	188
Securitised positions	0	0	1	31	0	105
Leasing receivables	0	0	0	5	1,668	0
Trade receivables	0	0	0	0	2,217	0
Other	0	0	64	254	0	1
Total 2016	**5,662**	**1**	**3,019**	**4,952**	**4,041**	**295**
Total 2015	3,762	1	3,104	5,535	3,124	365

Based on the country of the securitised claim, the securitisation exposures originate predominantly from Germany at 60% (2015: 48%), the USA 29% (2015: 31%) and the UK/Ireland 3% (2015: 6%).

The next table provides a breakdown of acquired or retained securitisation exposures by risk weighting bands. Risk weightings are ascertained by applying the risk approach applicable to each securitisation exposure as per Article 259 CRR. If a securitisation exposure has an external rating of B+ or worse, the exposure is deducted from CET1 capital. The capital requirements are determined by the exposure and its risk weighting after taking account of any impairments.

Table 35: Retained or acquired securitisation exposures in the banking book by risk weighting band

IRBA	RBA		IAA		SFA	
Risk weighting band | €m	**Position value**	**Capital requirement**	**Position value**	**Capital requirement**	**Position value**	**Capital requirement**
≤ 10%	2,835	17	1,478	10	5,572	31
> 10% ≤ 20%	130	1	1,397	21	0	0
> 20% ≤ 50%	7	0	732	18	154	3
> 50% ≤ 100%	0	0	278	14	0	0
> 100% ≤ 650%	1	0	0	0	0	0
> 650% < 1,250%	0	0	0	0	21	16
Total 2016	**2,972**	**19**	**3,885**	**63**	**5,747**	**51**
Total 2015	3,029	22	2,939	39	3,921	42

SACR	RBA		IAA		LTA	
Risk weighting band | €m	**Position value**	**Capital requirement**	**Position value**	**Capital requirement**	**Position value**	**Capital requirement**
≤ 10%	0	0	0	0	0	0
> 10% ≤ 20%	4,539	73	0	0	0	0
> 20% ≤ 50%	50	2	188	8	0	0
> 50% ≤ 100%	182	15	0	0	0	0
> 100% ≤ 650%	8	2	0	0	94	11
> 650% < 1,250%	0	0	0	0	0	0
Total 2016	**4,779**	**91**	**188**	**8**	**94**	**11**
Total 2015	4,999	93	230	9	447	32

As at 31 December 2016 the value of the securitisation exposures (including resecuritisations) deducted from equity capital was €287m (2015: €259m). After taking account of impairments, the capital deduction amounted to €254m (2015: €236m). The next table provides a breakdown of acquired or retained resecuritisation exposures by risk weighting bands. The capital requirement values do not consider hedge positions or insurances.

Table 36: Retained or acquired resecuritisation exposures in the banking book by risk weighting band

	IRBA		SACR	
Risk weighting band | €m	**Position value**	**Capital requirement**	**Position value**	**Capital requirement**
≤ 10%	0	0	0	0
> 10% ≤ 20%	0	0	0	0
> 20% ≤ 50%	17	1	0	0
> 50% ≤ 100%	0	0	0	0
> 100% ≤ 650%	1	0	0	0
> 650% < 1,250%	0	0	0	0
Total 2016	**17**	**1**	**0**	**0**
Total 2015	55	4	11	1

The table below shows the outstanding volumes of the Commerzbank Group's securitisation transactions. These were originator transactions with recognised regulatory risk transfer or primary ABCP-funded sponsor transactions

Table 37: Securitisation assets outstanding

	Originator Traditional		Originator Synthetic		Sponsor[1]	
€m	2016	2015	2016	2015	2016	2015
Loans to companies/SMEs	71	71	5,996	4,000	214	261
Commercial real estate	0	0	0	13	0	0
Residential real estate	0	0	0	65	0	0
Consumer loans	0	0	0	0	189	225
Securitised positions	0	0	0	0	1	1
Leasing receivables	0	0	0	0	2,316	1,040
Trade receivables	0	0	0	0	1,824	1,419
Other	0	0	0	0	40	47
Total	**71**	**71**	**5,996**	**4,079**	**4,583**	**2,993**

[1] Mainly ABCP.

On the reporting date, the securitised portfolios included non-performing or past due loans as shown below.

Table 38: Impaired / past-due assets securitised

	Non-performing loans		Past due loans	
€m	2016	2015	2016	2015
Loans to companies/SMEs	13	0	9	6
Commercial real estate	0	2	0	0
Residential real estate	0	1	0	0
Total	**13**	**3**	**9**	**6**

During the period under review, portfolio losses occurred under the two repaid originator transactions of Loan Solutions Frankfurt GmbH: €0.4m (previous year: €0.8m) where the underlying asset class was residential real estate and €3.2m (previous year: €0.4m) where the underlying asset class was commercial real estate. Commerzbank AG incurred portfolio losses of €5m (previous year: no loss) on traditional originator transactions where the underlying asset class was loans to companies. We have taken the information on portfolio losses and on impaired and past due claims from the investor reports for the respective underlying transactions.

Securitisation exposures in the trading book The information in this section relates to securitisation exposures in the trading book (excluding the correlation trading portfolio) for which risk-weighted exposure values are determined in accordance with Article 337 CRR. This comprises securitisation exposures where Commerzbank acts as sponsor, originator or investor.

The total net exposure of all retained or acquired securitisation positions was €2m at the reporting date, including credit derivative hedges according to article 337 CRR. There are no further off-balance-sheet hedge positions.

The table below shows the retained or acquired securitisation exposures by type of exposure:

Table 39: Retained or acquired securitisation exposures in the trading book by type of exposure

	Originator		Investor	
€m	IRBA	SACR	IRBA	SACR
Securities	0	0	0	2
Derivatives	0	0	0	0
Total 2016	**0**	**0**	**0**	**2**
Total 2015	1	0	19	4

The trading book's retained or acquired securitisation position with a total net exposure of €2m is subject to SACR and relates to the type of asset "Securitised position".

Based on the country of the securitised claim most of these securitisation exposures originate from the USA.

At year-end 2016 there were no material retained or acquired resecuritisation exposures in the trading book, hence the report by risk weighting band is dropped (total at year-end 2015: position value €18m, capital requirement €0m).

As at the end of the reporting period, there were no trading book securitisation exposures that were not deducted from CET1. As at 31 December 2016 the value of the securitisation exposures to be deducted from equity capital (including resecuritisations) as well as the capital requirement is €2m (2015: €5m).

Market risk

Market risk is the risk of financial losses due to changes in market prices (interest rates, commodities, credit spreads, exchange rates and equity prices) or in parameters that affect prices such as volatilities and correlations. Losses may impact profit or loss directly, e.g. in the case of trading book positions. However, for banking book positions they would be reflected in the revaluation reserve or in hidden liabilities/reserves.

Risk management

Strategy and organisation

Commerzbank's market risk strategy is derived from its overall risk strategy and the business strategies of the individual segments. It sets targets for market risk management in relation to Commerzbank's main business activities. The core market risk management tasks are the identification of all key market risks and drivers of market risk and the independent measurement and evaluation of these. The results and estimates serve as the basis for risk/return-oriented management.

The Board of Managing Directors of Commerzbank is responsible for ensuring the effective management of market risk throughout the Commerzbank Group. Specific levels of authority and responsibility in relation to market risk management have been assigned to the appropriate market risk committees.

Within the Bank, various market risk committees have been established. In these, segment representatives, along with representatives from the risk function and finance area, discuss current risk positioning issues and decide on appropriate action. Chaired by the risk function, the Group Market Risk Committee, which meets monthly, deals with Commerzbank Group's market risk position. Discussions centre on the monthly market risk report, which is also presented to the Board of Managing Directors for their consideration. The report summarises the latest developments on financial markets, the Bank's positioning and the risk ratios derived from this. The Segment Market Risk Committee, which focuses on the trading-intensive Corporate Clients and Treasury areas, meets once a week. This committee also manages market risks arising from non-core activities (Asset & Capital Recovery).

The risk management process involves the identification, measurement, management and monitoring of risks and reporting on them. It is the responsibility in functional terms of market risk management, which is independent of trading activities. Central market risk management is complemented by decentralised market risk management units at segment level and for regional units and subsidiaries. The close integration of central and local risk management with the business units means that the risk management process starts in the trading areas themselves. The trading units are responsible in particular for the active management of market risk positions, e.g. reduction measures or hedging.

Risk management

Commerzbank uses a wide range of quantitative and qualitative tools to manage and monitor market risk. Quantitative limits for sensitivities, value at risk (VaR) figures, stress tests, scenario analyses and ratios on economic capital limit the market risk. Our comprehensive rulebook, in the form of market risk policies and guidelines as well as restrictions on portfolio structure, new products, maturities and minimum ratings, establishes the qualitative framework for market risk management. The market risk strategy lays down the weighting of figures in each segment by reference to their relevance. Thereby allowance is made for the varying impact of the parameters for the management of the segments in line with the business strategy.

Market risk is managed internally at Group level, segment level and in the segment's reporting units. A comprehensive internal limit system broken down to portfolio level is implemented and forms a core part of internal market risk management.

The quantitative and qualitative factors limiting market price risk are determined by the market risk committees by reference to the Group's management of economic capital. The utilisation of these limits, together with the relevant net income figures, is reported daily to the Board of Managing Directors and the responsible heads of the Group divisions. Based on qualitative analyses and quantitative ratios, the market risk function identifies potential future risks, anticipates potential financial losses in collaboration with the finance function, and draws up proposals for further action, which are discussed with the market units. Voting on the proposed measures or exposures takes place in the above-mentioned market risk committees and is subsequently submitted to the Board of Managing Directors for approval.

Risk concentrations are restricted directly with specific limits or are indirectly avoided, for example using stress test limits. In addition, the combination of various conventional risk measures (e.g. VaR, sensitivities) ensures the appropriate management of concentration risks. Furthermore, risk drivers are analysed on a regular basis in order to identify concentrations. The risk management of existing concentrations is also reviewed using situation-driven analyses and, where necessary, supplemented by targeted measures such as limits.

Any individual limits that are breached are handled in a separate escalation procedure. After a limit breach has been identified, the front office and risk units design measures to bring the respective portfolio back within the limit. If the limit breach cannot be remedied within a few days, it will be escalated by the market risk function to the next hierarchical level.

Regulatory risk measures that are not included in economic risk-bearing capacity are limited and managed separately. These include, for example, stressed VaR and incremental risk charge.

Market risk model

Value at Risk

A standardised value at risk model incorporating all positions is used for the internal management of market risk. The VaR quantifies the potential loss from financial instruments as a result of changed market conditions over a predefined time horizon and with a specific probability.

Our VaR market risk model is based on a historical simulation with a one-year interval of historical market data. The historical simulation determines the profit and loss distribution of the current portfolio by means of revaluation using historical changes in market prices and volatility. This is done on the basis of independent market data which is quality-assured on a daily basis and fed into a central market database at a standard defined time. Market data is provided for all relevant positions in the asset classes interest rates, credit spreads, equities, foreign currencies and commodities. This market data takes the form of prices quoted directly on the market or market data such as yield and credit spread curves derived using internal methods. A proxy concept is used if no market data is available for individual exposures. In this case, prices are derived from those for comparable instruments.

For internal management purposes, a confidence level of 97.5% and a holding period of one day are assumed. The value at risk concept makes it possible to compare risks over a variety of business areas. It enables many positions to be aggregated, taking account of correlations between different assets. This ensures a consolidated view of the market risk at all times. A comprehensive internal limit system broken down to portfolio level is implemented and represents an important part of internal market risk management.

The VaR market risk model described above is also used to calculate regulatory required capital. This regulatory capital backing is required for trading book risks and for currency and commodity price risks in the banking book. A confidence level of 99% and a ten-day holding period are used for the regulatory capital adequacy requirement. These assumptions meet the requirements of the Basel Committee and other international standards on the management of market risk. For certain evaluations, such as backtesting and disclosure, the VaR is also calculated on the basis of a one-day holding period. In order to provide a consistent presentation in this report, all figures relating to the VaR are based on a confidence level of 99%, a holding period of one day, equally weighted market data and a 254 days' history.

Stress test

As the VaR concept gives a prediction of potential losses on the assumption of normal market conditions, it is supplemented by the calculation of stress tests. These stress tests measure the risk to which Commerzbank is exposed, based on unlikely but still plausible events. These events may be simulated using extreme movements on various financial markets. The key scenarios relate to major changes in credit spreads, interest rates and yield curves, exchange rates, share prices and commodities prices. Events simulated in stress tests include all stock prices falling by 15%, a parallel shift in the yield curve or changes to the curve's gradient.

Extensive Group-wide stress tests and scenario analyses are carried out as part of risk monitoring. The Bank-wide stress test calculation is based on a combination of short-term stress test scenarios and scenarios based on macro-economic variables. The stress test framework is completed by portfolio-specific stress tests and ad-hoc scenario analyses.

Stress tests are intended to simulate the impact of crises and extreme market conditions on the Bank's overall market risk position. The impact on the respective components of capital and the income statement is also quantified in these tests.

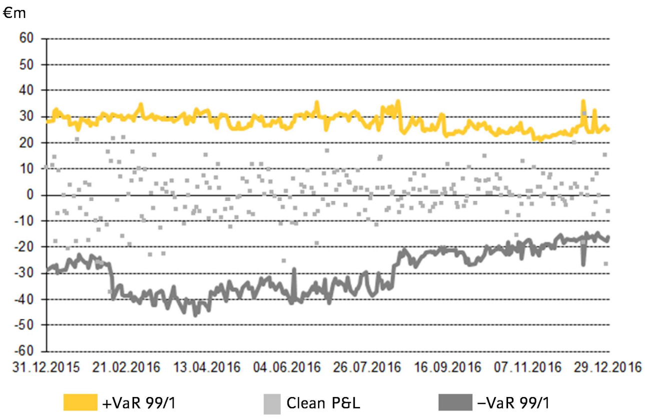
In order to manage and monitor risks, short-term scenarios are calculated daily, compared against fixed limits and reported to the Board of Managing Directors. The longer-term scenarios are calculated on a monthly basis and discussed in the respective committees.

Model validation

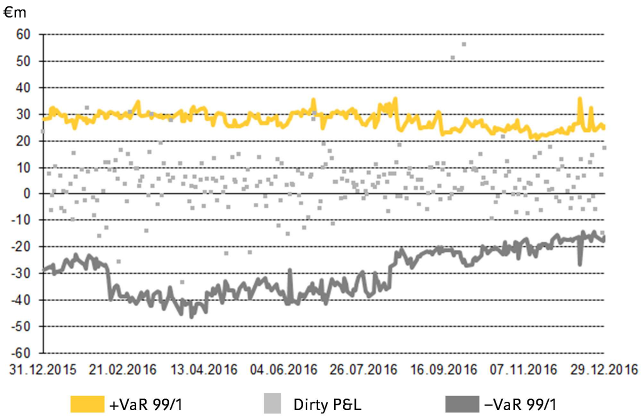
The reliability of the internal model is monitored by backtesting on a daily basis. The VaR calculated is set against actually occurring profits and losses. The process draws a distinction between "clean P&L" and "dirty P&L" backtesting. In the former, exactly the same positions in the income statement are used as were used for calculating the VaR. This means that the profits and losses solely result from changes in market prices. In dirty P&L backtesting, by contrast, profits and losses from newly-concluded and expired transactions from the day under consideration are included. If the loss thus arrived at exceeds the VaR, it is described as a negative backtesting outlier.

Analysing the results of backtesting provides an informative basis for checking parameters and for improving the market risk model. In the year 2016, we saw three negative clean P&L outliers and one negative dirty P&L outlier. As such, the results are in line with statistical expectations and confirm the quality of the VaR model. Backtesting is also used by the supervisory authorities for evaluating internal risk models. Negative outliers are classified by means of a traffic-light system laid down by the supervisory authorities. All negative backtesting outliers at Group level (from both clean P&L and dirty P&L) must be reported to the supervisory authorities, citing their extent and cause.

Clean P&L backtesting results



Dirty P&L backtesting results



The individual components of the internal model are regularly validated for their appropriateness for risk measurement. These include the underlying model assumptions and parameters and the proxies used. Validation analyses are carried out based on the validation concept using materiality- and risk-based prioritisation and planning. The Validation Committee is informed of the validation planning and its progress. In addition to the further development of the validation methodology for key components of the economic capital model for market risk, the focus of the validation activities in 2016 was on the stressed VaR period, the allowance for the credit spread and the specific risk analysis for the pension fund.

The validations performed are reported to the Group Market Risk Committee on a quarterly basis. The identification and elimination of any model shortcomings are of particular importance. Also against this background, model adjustments were implemented in 2016 and approval for a model change requested from the regulator to further improve the accuracy of risk measurement. This was caused in particular by the changed market environment for interest rates and interest rate volatilities.

In November 2016 a new division was created in GRM-CC to bundle together validation activities for risk models for all risk types.

Valuation of financial instruments

Valuation models must be consistent with accepted economic methodologies for pricing financial instruments. They must incorporate all factors that market participants would consider appropriate in setting a price. In the Commerzbank Group, standards have been established in the form of internal controls and procedures for the independent verification and validation of all fair values. These controls and procedures are managed or coordinated by the Independent Price Verification (IPV) Group within the finance function. The models, inputs and resulting fair values are reviewed regularly by senior management and the risk function.

The IPV process is founded on a risk-based approach. This also takes into account internal factors such as changes in business strategy, the expansion or downsizing of business activities and external factors such as developments in markets, products and valuation models. The regular independent price testing mainly consists of analysing prices or input parameters and calculating the associated change in fair value and the P&L. If a price is directly observable, e.g. the settlement price of a future or the stock market price of a share, the products are valued at the bid or offer side, depending on whether they are a long or a short position. However, if a valuation model for determining fair value is applied, the respective input parameters at mid-market are used, e.g. implied volatilities or dividends to value a share option, plus any possible bid-offer reserves.

IFRS 13, which has had to be applied since the financial year 2013, standardises the rules for measuring fair value. Under IFRS 13, the fair value of an asset is the amount for which it could be sold between knowledgeable, willing, independent parties in an arm's length transaction. The fair value therefore represents a realisable price.

The fair value of a liability is defined as the price at which the debt could be transferred to a third party as part of an orderly transaction. Furthermore, for the valuation of a debt one's own default risk has to be considered.

The most suitable measure of fair value is the quoted price for an identical instrument in an active market (fair value hierarchy level I). In cases where no quoted prices are available, valuation is based on quoted prices for similar instruments in active markets. Where quoted prices are not available for identical or similar financial instruments, fair value is derived using an appropriate valuation model where the data inputs are obtained, as far as possible, from verifiable market sources (fair value hierarchy level II).

Most valuation methods are based on data from verifiable market sources. However, some valuation models use inputs for which sufficient verifiable current market data is not available. These valuation methods inherently include a greater level of expert or management judgement. These unobservable inputs may include data that is extrapolated or interpolated, or may be derived by approximation to correlated or historical data. However, to a maximum extent, these inputs are market or third-party inputs and rely as little as possible on expert estimates or company-specific inputs (fair value hierarchy level III).

Quantitative information on market risks

Market risk in the trading book

The development of regulatory market risk ratios in the trading book portfolio is shown below. Most of Commerzbank's trading book positions derive from the Corporate Clients and Treasury divisions.

The VaR fell from €29m to €15m over the year. The decline was mainly caused by a defensive position in light of the political events in 2016 (Brexit, US presidential elections, referendum in Italy).

Table 40: VaR of trading book portfolios (based on regulatory capital requirement)

VaR | €m	2016	2015
Minimum	14	17
Average	30	25
Maximum	46	39
Year-end figure	**15**	**29**

The market risk profile is diversified across all asset classes. The dominant asset classes are credit spread and foreign exchange risks, followed by interest rate risks and equity price risks. To a lesser extent, value at risk is also affected by commodity and inflation risk.

Further risk ratios are calculated for regulatory capital adequacy. This includes the calculation of stressed VaR. Stressed VaR is calculated using the internal model on the basis of the VaR method described above. The main difference lies in the market data used to value the assets. Stressed VaR measures the risk in the present position in the trading book by reference to market movements from a specified crisis period in the past. The crisis observation period used for this is checked regularly through model validation and approval processes and adjusted where necessary. The crisis observation period was changed in the course of the year. This is the cause for the sharp rise in stressed VaR year-on-year.

Table 41: Stressed VaR of trading book portfolios

VaR | €m	2016	2015
Minimum	17	25
Average	28	34
Maximum	51	49
Year-end figure	**48**	**27**

In addition, the incremental risk charge and equity event VaR ratios quantify the risk of deterioration in creditworthiness as well as event risks in trading book positions. Equity event VaR is conceptually part of the historical simulation taking into account empirical equity events over long observation periods. It is a component in the regulatory VaR calculation and included in the values of table 40.

The incremental risk charge is based on the credit VaR model with historical data for rating migration and default probabilities and for recovery factors. The model shows current gains and losses on positions in the event of rating changes. In addition, in calculating the incremental risk charge, assumptions are made regarding liquidity (average regrouping/liquidity horizon). These liquidity horizons are set on a portfolio-specific basis, taking into account market structure and activity and concentrations of positions. The incremental risk charge as at 31 December 2016 was as follows:

Table 42: Incremental risk charge

IRC | €m	2016	2015
Minimum	143	107
Average	164	180
Maximum	195	247
Year-end figure	**163**	**148**

Table 43: Incremental risk charge by sub-portfolio

Sub-portfolio	IRC[1] €m	Average regrouping horizon | months
Corporates & Markets	167	4.4
Treasury	1	12.0

[1] Excluding diversification effects between sub-portfolios.

Stressed VaR rose by €21m year-on-year to €48m. This was mainly due to the introduction of a new stressed VaR period. The incremental risk charge rose by €15m to €163m. This was mainly attributable to exposure changes in the business area Corporate Clients.

Market liquidity risk

In taking steps to ensure economic capital adequacy, Commerzbank also considers market liquidity risk. This is the risk of the Bank not being able to liquidate or hedge risky positions in a timely manner, to the desired extent and on acceptable terms as a result of insufficient liquidity in the market.

The first step is to create a realistic downsizing profile for each portfolio on the basis of its product and risk strategies and an assessment of the market. This enables portfolios to be classified in terms of their convertibility into cash using a “market liquidity factor”. The market liquidity factor takes into account the heightened volatility of portfolio value resulting from the extended holding period for risk positions in line with the portfolio’s downsizing profile. The market risk of every portfolio is then evaluated based on a one-year view and weighted with the market liquidity factor.

At the end of 2016, Commerzbank earmarked €0.2bn in economic capital to cover market liquidity risk in the trading and banking book. Asset-backed securities and structured products in particular have a higher market liquidity risk.

Table 44: Market liquidity VaR

Capital requirement | €m	2016	2015
Minimum	193	151
Average	219	202
Maximum	251	256
Year-end figure	**217**	**207**

Interest rate risk in the banking book

Interest rate risk is one of the most significant financial risks posed by banking operations. This includes in particular the risk of value adjustments as a result of interest rate fluctuations over time. The maturity of interest rate positions and their refinancing structure are fundamental factors in the management of interest rate risks. In commercial business, the modelling of interest rate risk includes assumptions on early repayments and on investor behaviour when deposits are open-ended. The risk of a flattening or steepening in the yield curve is also covered. Interest rate risks may also arise if positions are closed as a result of hedging transactions with a different pricing type to the underlying transaction (basis risks). Interest rate risks relate to Commerzbank’s banking book and trading book. The combined position of both books results in Commerzbank’s overall interest rate risk.

Strategy and organisation

The interest rate risk in the Commerzbank Group’s banking book primarily results from commercial business. Interest rate risks arise here if interest rate positions in customer business are not hedged or are only partially hedged. Interest rate risks also arise from the investment models used by the central ALCO (Asset Liability Committee), which comprise in particular the investment and/or refinancing of products without contractually fixed interest rates, e.g. for equity capital, savings and sight deposits.

In the Commerzbank Group, interest rate risk in the banking book is the responsibility of Group Treasury within the scope of the business strategy. In addition to the positions of the central Group Treasury division, the treasury activities of branches and all subsidiaries are also taken into consideration.

Treasury’s main tasks include the management of the balance sheet structure and of liquidity risks. The aim is to generate a positive interest margin from interest income and refinancing expenses. This gives rise to interest rate risks if positions are not refinanced with matching maturities and matching currencies.

Management

Commerzbank jointly manages interest rate risk from both the trading and banking book. This is done strategically by means of risk policies and operationally by means of appropriate limit systems. The risks are consolidated in central risk management. Central risk management is supplemented by a risk management unit for Treasury within the market risk function.

Interest rate risks in the banking book are managed in line with the business strategy by means of maturity- and currency-congruent refinancing and the use of interest rate derivatives. For example, interest rate swaps with sufficient market liquidity enable a prompt response to management measures. However, some products without fixed maturities, such as sight and savings deposits or equity capital, are available to the Bank in the long term. Here the Bank uses appropriate models to manage interest rate risks and stabilise earnings performance. Our models are regularly monitored.

Quantitative information on interest rate risks in the banking book

The measurement of interest rate risk is completely integrated into the Bank's daily measurement and monitoring of risk. As with the measurement of trading book risks, risks in the banking book are also quantified using the value at risk method. Stress tests and scenario analyses are also calculated on a daily and monthly basis. The stress test calculations as mentioned above are used for this purpose. This standardised procedure is intended to ensure transparency of interest rate risks in both the trading and banking book.

A further control variable for interest rate risks in the banking book is interest rate sensitivities. These indicate how interest income varies following a change in interest rates, for example of one basis point (bp). Interest rate sensitivities are also monitored on a daily and monthly basis. This monitoring takes place at both portfolio and segment level as well as for the Commerzbank Group. For management purposes, interest rate sensitivities are limited to the various maturity bands at both Group and segment level. The main focus is on interest rate sensitivities relating to long maturity periods.

The impact of an interest rate shock on the economic value of the Group's banking books is simulated monthly in compliance with regulatory requirements. In accordance with the Banking Directive, the Federal Financial Supervisory Authority (BaFin) has prescribed two uniform, sudden and unexpected changes in interest rates (+/–200 basis points) to be used by all banks, which have to report on the results of this stress test every quarter.

On this basis, the interest rate shift of +200 basis points would give a potential loss of €2,066m, and the shift of –200 basis points would lead to a potential gain of €425m as at 31 December 2016.

Table 45: Interest rate risk in the banking book by currency

€m	2016		2015	
Interest rate shock	**–200 bp**	**+200 bp**	**–200 bp**	**+200 bp**
EUR	–311	–1,618	63	–1,417
USD	147	–67	266	–142
GBP	463	–391	627	–180
JPY	66	2	89	6
CHF	54	12	62	–14
Other	6	–4	33	–36
Total	**425**	**–2,066**	**1,141**	**–1,784**

The potential gains and losses in comparison to 2015 are primarily caused by movements in the Euro and GBP yield curve. In addition, a change in the Treasury interest rate position was influencing the EUR result.

Liquidity risk

We define liquidity risk in a narrower sense as the risk that Commerzbank will be unable to meet its payment obligations on a day-to-day basis. In a broader sense, liquidity risk describes the risk that future payments cannot be funded for the full amount, in the required currency or at standard market conditions, as and when they are due.

Risk management

Strategy and organisation

The Board of Managing Directors adopts the business strategy and the Bank's risk tolerance, which is associated with it. Liquidity risk tolerance is then operationalised by defining the liquidity reserve period and the limit framework. In order to ensure an appropriate liquidity risk management process, the Board of Managing Directors delegates certain competences and responsibilities in connection with the Group-wide liquidity risk strategy to the risk and treasury functions.

The central Asset Liability Committee (ALCO) is responsible for limiting, analysing and monitoring liquidity risk and for strategic liquidity positioning. ALCO is supported by various sub-committees in this.

Risk management

Commerzbank uses a wide range of tools on the basis of its own liquidity risk model to manage and monitor liquidity risks. The stress scenario within the Bank that underlies the model and is relevant for management purposes allows for the impact of both a bank-specific stress event and a broader market crisis. Binding regulatory requirements are an integral component of the management mechanism.

Group Treasury is responsible for the Group's liquidity management operations. Group Treasury is represented in all major locations of the Group in Germany and abroad and has reporting lines into all subsidiaries. Additional information on this subject can be found in the section "Funding and liquidity of the Commerzbank Group" in the Group Management Report. Liquidity risk is monitored on the basis of the Bank's own liquidity risk model by the independent risk function.

The Bank has established early warning indicators for the purpose of managing liquidity risk. These ensure that appropriate steps can be taken in good time to secure long-term financial solidity.

Risk concentrations can lead to increased outflows of liquidity, particularly in a stress situation, and thus to increased liquidity risk. They can, for example, occur with regard to maturities, large individual creditors or currencies. By means of ongoing monitoring and reporting, emerging risk concentrations in funding can be recognised in a timely manner and mitigated through suitable measures.

In the event of a liquidity crisis, the emergency plan provides for various measures for different types of crisis that can be launched by the central ALCO. The emergency plan forms an integral part of Commerzbank's recovery plan and is updated at least once a year, whereas the individual liquidity emergency measures are checked regularly during the year for plausibility. The emergency plan also defines a clear allocation of responsibilities for the processes to be followed in emergency situations and gives details of any action that may need to be taken.

Information on the encumbrance of assets pursuant to Article 443 CRR can be found in the Annual Report 2016, pages 314-315.

Liquidity risk model

A key component of liquidity risk management is the daily calculation of the liquidity gap profile. The liquidity gap profile shows the deterministic or stochastic inflows and outflows expected in the future on a given reporting date and across all portfolios. This forms the basis for calculating liquidity requirements or excess liquidity per maturity band. This also includes modelling the proportion of customer deposits that will be permanently available, known as the core deposit base.

The liquidity gap profile is also used to set the issuance strategy of the Commerzbank Group, which is operationalised by the Group Treasury division. Group Finance is responsible for calculating and allocating liquidity costs on the basis of the liquidity gap profile, which are then incorporated in the management of the segments' business activities.

Based on the methodology of the liquidity gap profile, management mechanisms such as recovery and early warning indicators are limited and monitored accordingly. The liquidity gap profile is limited in all maturity bands. The Group limits are broken down into individual Group units and currencies. The internal liquidity risk model is complemented by the regular analysis of additional adverse, reverse and historical stress scenarios.

Stress tests

Commerzbank uses a wide range of tools to manage and monitor liquidity risks on the basis of its internal liquidity risk model. In addition to internal economic considerations, liquidity risk modelling also factors in the binding regulatory requirements under the Capital Requirements Regulation (CRR) and the stricter requirements of the Minimum Requirements for Risk Management (MaRisk). Commerzbank incorporates this within its liquidity risk framework, thereby quantifying the liquidity risk appetite established by the Board of Managing Directors.

The stress scenarios within the Bank that underlie the model and are relevant for management purposes allow for the impact of both a bank-specific stress event and a broader market crisis. The Commerzbank-specific idiosyncratic scenario simulates a stress situation arising from a rating downgrade of two notches, whereas the market-wide scenario is derived from experience of the subprime crisis and simulates a market-wide shock. The main liquidity risk drivers of both scenarios are a markedly increased outflow of short-term customer deposits, above-average drawdown of credit lines, prolongation of lending business regarded as commercially necessary, the need to provide additional collateral for secured transactions and the application of higher risk discounts to the liquidation values of assets.

As a complement to the individual scenarios, the Bank also simulates the impact on the liquidity gap profile (net liquidity position) of a scenario that combines idiosyncratic and market-specific effects. The liquidity gap profile is shown for the whole of the modelling horizon across the full spectrum of maturities and follows a multi-level concept. This allows for a nuanced presentation of deterministic and modelled cash flows in existing business on the one hand and the inclusion of prolongations on the other.

The following table shows the liquidity gap profile after application of the respective stress scenarios for periods of one and three months. Obviously, significantly more liquidity flows out in a combined stress scenario compared with the individual scenarios. As at 31 December 2016, in the one-month and three-month periods, the combined stress scenario leaves the net liquidity to €18.5bn and €21.6bn respectively.

Table 46: Liquidity gap profile in the stress scenarios

Net liquidity in the stress scenario | €bn		31.12.2016
Idiosyncratic scenario	1 month	23.0
	3 months	27.5
Market-wide scenario	1 month	26.8
	3 months	29.9
Combined scenario	1 month	18.5
	3 months	21.6

Liquidity reserves

Significant factors in the liquidity risk appetite include the reserve period, the size of the liquidity reserve portfolio held to compensate for unexpected short-term liquidity outflows, and the limits in the various maturity bands. As the liquidity reserve portfolio consists of highly liquid assets, it functions as a buffer in stress situations. The liquidity reserve portfolio is funded in line with the liquidity risk appetite in order to ensure that it is kept at the required size throughout the entire reserve period stipulated by the Board of Managing Directors.

As at the reporting date, the Bank had a liquidity reserve of €80.0bn in the form of highly liquid assets. A part of this liquidity reserve is held in a separate stress liquidity reserve portfolio managed by Treasury to cover liquidity outflows should a stress event occur and to ensure solvency at all times. In addition, the Bank operates an intraday liquidity reserve portfolio in the amount of €8.4bn as at the reporting date.

Liquidity reserves comprise highly liquid assets made up of the following three components:

- Level 1 contains cash holdings, withdrawable deposits at central banks, assets of central governments, central banks, regional and local governments, public-sector entities, multilateral development banks and international organisations, banks with state guarantees, qualifying units or equities of undertakings for collective investment (UCIs) with level 1 assets, excluding extremely high quality covered bonds, as underlyings, covered bonds (minimum rating AA–, minimum issue volume €500m, over-collateralisation at least 2%).
- Level 2A contains assets of central governments, central banks, regional and local governments, public-sector entities (with a 20 % risk weighting); also covered bonds (not contained in level 1), corporate bonds (minimum rating AA–, minimum volume €250m, maximum original maturity 10 years), qualifying units or equities of UCIs with level 2A assets as underlying assets.
- Level 2B contains equities (from main indices), corporate bonds (minimum rating BBB–, minimum volume €250m, maximum original maturity 10 years), qualifying units or equities of UCIs with corporate bonds (credit quality steps 2/3), equities (major equity index) or non-interest bearing assets (held by banks for religious reasons) (credit quality steps 3-5) as underlying assets.

Table 47: Liquidity reserves from highly liquid assets

Liquidity reserves from highly liquid assets €bn	31.12.2016
Highly liquid assets	80.0
of which level 1	64.6
of which level 2A	13.6
of which level 2B	1.8

Liquidity ratios

In 2016, Commerzbank's internal liquidity ratios, including the regulatory liquidity coverage ratio (LCR), were at all times above the limits set by the Board of Managing Directors. The same is true of compliance with the survival period calculation set down by MaRisk and with the external regulatory German Liquidity Regulation; at the end of the year, the liquidity ratio under the German Liquidity Regulation stood at 1.52.

The regulatory LCR is contained in the internal liquidity risk model as a binding secondary condition. The LCR is calculated as the ratio of liquid assets to net liquidity outflows under stressed conditions. It is used to measure whether a bank has a large enough liquidity buffer to independently withstand any potential imbalance between inflows and outflows of liquidity under stressed conditions over a period of 30 calendar days. Following an introductory period, a minimum ratio of 100% must be complied with from 1 January 2018 onwards. From the start of the new financial year 2017, the ratio to be complied with is 80%.

In the past financial year 2016, Commerzbank significantly exceeded the stipulated minimum ratio of 70% on every reporting date, meaning that its LCR remained very comfortably in excess of minimum statutory requirements last year.

Operational risk

Based on the Capital Requirements Regulation (CRR), Commerzbank defines operational risk (OpRisk) as the risk of loss resulting from the inadequacy or failure of internal processes, people and systems or from external events. This definition includes legal risks; it does not cover strategic or reputational risks. Given its heightened economic significance, compliance risk is managed as a separate risk type. In line with the CRR, however, losses from compliance risks are still incorporated into the model for determining regulatory and economic capital for operational risks.

Risk management

Strategy and organisation

Within Commerzbank, OpRisk and governance issues of the internal control system (ICS) are closely connected in terms of both organisational structure and methodology and are continuously being enhanced. This is because many OpRisk cases are closely linked with failures in the control mechanisms. A properly functioning ICS thereby helps to reduce or avoid losses from operational risks and thus to lower the amount of capital required to cover operational risks in the medium to long term. Conversely, the operational risk management systems enable the ICS to adapt itself consistently to them. Strengthening the ICS control mechanism is an essential aspect of the proactive reduction and prevention of operational risks.

Chaired by the CRO, the Group OpRisk Committee meets four times a year and deals with the management of operational risks within the Commerzbank Group. It also acts as the escalation and decision-making committee for key OpRisk topics that span all areas. The Management Boards and/or the Segment Committees with responsibility for operational risk deal with the management of operational risk in the relevant units. They analyse all OpRisk issues that affect them, such as loss events, and define subsequent measures or recommend action.

Commerzbank's OpRisk strategy is approved on an annual basis by the Board of Managing Directors after it has been discussed and voted upon in the Group OpRisk Committee. It describes the risk profile, key elements of the desired risk culture, its management framework and measures to be taken by the Bank to manage operational risk.

As such, OpRisk management is based on three consecutive levels (three lines of defence) which, when taken together, are crucial for reaching the given strategic aims.

Risk management

Commerzbank takes an active approach to managing operational risk, aiming to systematically identify OpRisk profiles and risk concentrations and to define, prioritise and implement risk mitigation measures.

Operational risks are characterised by asymmetric distribution of losses. This means that most of the losses are relatively small, while isolated losses with a very low probability of occurrence have the potential to be large and devastating. This makes it necessary not only to limit high loss potential but also to proactively manage losses that can be expected to occur frequently.

To do this, Commerzbank has set up a multi-stage system that brings together the defined limits on economic capital (risk capacity) and those set for operational risk management during the year (risk appetite/tolerance), complemented by rules on the transparent and conscious acceptance and approval of individual risks (risk acceptance).

OpRisk management includes an annual evaluation of the Bank's ICS and a risk scenario assessment. OpRisk loss events are also subject to ongoing analysis and ICS backtesting on an event-driven basis. Where loss events involve ≥ €1m, lessons learned activities are carried out. External OpRisk events at competitors are also systematically evaluated.

A structured, centralised and decentralised reporting system ensures that the management of the Bank and its segments, members of the OpRisk Committees and the supervisory bodies are informed regularly, promptly and fully about operational risk. OpRisk reports are produced quarterly. They contain changes in OpRisk losses, the segments' main loss events, current risk analyses, changes in the capital requirement and the status of measures implemented. Operational risks are also part of the regular risk reporting process to the Board of Managing Directors and to the Risk Committee of the Supervisory Board.

OpRisk model

Commerzbank measures regulatory and economic capital for operational risk using the advanced measurement approach (AMA). The capital charge determined using quantitative methods is supplemented by qualitative components, in line with the requirements of CRR. The AMA is applied throughout the group. The capital of a subsidiary not included in the AMA is calculated using an outside AMA.

Quantitative components

The AMA model's quantitative components include internal and external OpRisk loss data along with mathematical/statistical modelling.

Group-wide internal OpRisk loss data in line with regulatory requirements is collected from a starting threshold of €10,000 in a Group-wide loss database. As the internally calculated loss data history cannot always reflect extreme OpRisk events adequately, external OpRisk events must also be factored into the AMA model. For this purpose we use relevant external data from the Operational Riskdata eXchange Association (ORX), Zurich, a data consortium of international banks. For mathematical/statistical modelling, the data is grouped by combinations of business line, event category and region. Loss frequency is modelled on the basis of internal loss data, while distribution is modelled on the basis of internal and external loss data.

Modelling of insurance and alternative OpRisk transfers does not currently take place.

Qualitative components

Qualitative methods (risk scenario assessment and business environment and control system) are used to complement the information from the quantitative model components.

The risk scenario assessment is an ex-ante risk assessment of operational risks. Based on expert opinions and in accordance with the requirements of MaRisk, they serve to identify exceptional but plausibly possible risk events which could jeopardise the Bank's existence or severely affect its results and incorporate these into modelling.

The business environment and control (BEC) system provides incentives to reduce operational risk and improve risk management. Business environment and internal control factors are shown in the OpRisk model in the form of add-ons and reductions to regulatory and economic OpRisk capital. The BEC system takes into account the following qualitative OpRisk elements:

- Internal control system (ICS): As part of the annual ICS review, the company-wide ICS control mechanism is evaluated in terms of its functionality. To ensure that the internal control system factors are properly represented, the ICS as a BEC subject area consists of three components: ICS self-assessment (assessment by the units implementing the controls), ICS testing (independent review by internal audit) and ICS documentation (modelling status in the Bank's process model).
- Human resources risk: The human resources risk report prepared by the Group Human Resources division takes into account current areas of human resources activity and presents risk information on the basis of set criteria.
- IT risk: The IT risk report prepared by the Group Services division brings together data relating to IT risk in the areas of IT changes and incidents, IT security and access management. The data cover the four IT security targets: confidentiality, integrity, availability and transparency.
- Key risk indicators (KRIs): KRIs are used to manage operational risk by means of early warning signals.
- OpRisk management: The OpRisk & ICS area evaluates the active OpRisk management of the material units on the basis of a uniform list of criteria. Information on the progress made towards addressing audit findings is also included in the BEC system.
- Top-level adjustments (TLAs): TLAs are only used in well-founded exceptional cases to establish a risk buffer for extraordinary changes in the OpRisk environment and include this in the OpRisk capital calculation at short notice. No TLAs are currently applied.

Stress testing and validation

As an integral part of risk management and the risk-bearing capacity concept, stress tests for operational risk are carried out on a regular basis. As a basis for the stress methodology, the AMA model is consistently used to determine the capital requirement, with suitable increases in the relevant influencing factors (such as losses).

To ensure that the AMA model remains appropriate, the measurement approach is validated on a regular basis. The validation covers assessments of both quantitative and qualitative components and the interaction between them. The validation of all AMA components conducted in 2016 confirmed the appropriateness of the model. Insignificant changes are planned or have already been implemented as part of the ongoing development of the AMA measurement system. No need for material additions or changes was identified.

Other risks

In addition to the risk types explicitly defined in the CRR, further risk types are systematically and actively managed within the Commerzbank Group. For details on other risks please refer to page 119 ff. of the Risk Report in the Annual Report 2016.

Appendix

Consolidation matrix and material Group entities

While the Commerzbank Group's Annual Report is based on the group of consolidated entities under IFRS definitions, the information in this Disclosure Report relates to the entities consolidated for regulatory purposes.

Subsidiaries or controlled companies for the purposes of IFRS accounting that are not in the financial sector are not consolidated for regulatory purposes. They are, however, consolidated in the Group financial statements under IFRS.

The consolidation matrix (see following table 48) shows the regulatory consolidation categories for the various companies in Commerzbank Group. The material companies included in this Disclosure Report are shown individually in the upper part of the matrix.

The immaterial companies which are of lesser financial significance in accordance with the definition of materiality are shown in the lower part of the matrix.

The classification of the companies is based on section 1 KWG, supplemented by insurance companies and capital investment companies. The Commerzbank Group's investments that are not consolidated for regulatory purposes are not shown.

The Bank's classification includes both universal banks and specialist banks. Financial services institutions include investment companies, holding companies and other financial companies.

The special purpose vehicles that are deemed to be controlled by Commerzbank Aktiengesellschaft under the criteria of IFRS 10 are mainly securitisation vehicles and special funds consolidated under IFRS. 16 special purpose vehicles were consolidated under IFRS at the reporting date; there is currently no requirement to consolidate these vehicles for regulatory purposes.

Material companies of the Commerzbank Group are listed by name in the Company column in the consolidation matrix. The number of subsidiaries as well as investments of material companies which are relevant for regulatory purposes is shown, broken down into segments, by consolidation type in the Consolidation column. There are two types of consolidation for regulatory purposes: full and pro rata. Full consolidation is applied to subsidiaries and pro rata consolidation for qualified minority interests.

To avoid the deduction for investments pursuant to section 10.6 KWG, equity investments in institutions and financial companies may also be voluntarily consolidated on a pro rata basis.

The material entities in the Group – besides Commerzbank Aktiengesellschaft – are the following:

- mBank S.A. is a modern bank operating in the direct banking area. As such, it serves customers in retail, corporate and investment banking in Poland, and in retail banking in the Czech Republic and Slovakia. mBank is one of the largest financial institutions in Poland.
- comdirect bank AG is one of the leading direct banks in Germany. As a full-service bank, it offers private customers all services from one source. Belonging to the comdirect Group, comdirect bank is the market leader among Germany's online brokers.
- Commerz Real AG is a provider of leasing and investment solutions. At the end of 2016, the volume of the managed assets amounted to around €32bn.
- Effective from 15 February 2016, Commerzbank Finance & Covered Bond S.A. (CFCB) was originated through renaming Erste Europäische Pfandbrief- und Kommunalkreditbank AG in Luxembourg (EEPK). It is a specialist bank concentrating on public finance.
- Loan Solutions Franfurt GmbH (LSF, formerly Hypothekenbank Frankfurt AG) is a service company with the task to self-dependently and to the greatest possible extent, handle and further reduce the commercial real estate portfolio which has been transferred to Commerzbank Aktiengesellschaft.

Risk-weighted investments shown in table 49 below are investments that are consolidated under IFRS but not for regulatory purposes. They are allocated to the equity investments asset class under the CRR and are treated like any other investment position in this asset class.

Information on the Group consolidation of Commerzbank Aktiengesellschaft is set out in the notes to the Annual Report (online version), Note 103: Ownership interests.

Table 48: Consolidation matrix

Company	Classification according to KWG	No.	Consolidation
Material companies			
Commerzbank AG	Provider of secondary services	16	full
	Financial services institutions	4	full
	Financial companies	23	deduction
		41	full
	Capital investment company	1	deduction
		1	full
	Banks	1	pro rata
		8	deduction
		4	full
	Special purpose vehicles	16	-
Commerz Real AG	Provider of secondary services	5	full
	Financial services institutions	3	full
		1	deduction
	Financial companies	240	deduction
		16	full
	Capital investment company	1	deduction
		2	full
Commerzbank Finance & Covered Bond S.A.	Banks	1	full
Loan Solutions Frankfurt GmbH	Provider of secondary services	1	full
	Financial companies	6	deduction
comdirect bank AG	Banks	2	full
mBank S.A.	Provider of secondary services	2	full
	Financial services institutions	1	full
	Financial companies	3	full
		4	deduction
	Banks	2	full
Immaterial companies			
	Provider of secondary services	1	pro rata
		8	full
		1	deduction
	Financial companies	27	full
		119	deduction
	Capital investment company	3	full

Table 49: Investments consolidated under IFRS

Classification according to KWG	No.	Consolidation under IFRS
Other companies	24	full
Other companies	5	at equity

Additional tables

Table 50: Geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer

	General credit exposures		Trading book exposure		Securitisation exposure		Own funds requirements					
Countries €m	**Exposure value (SA)**	**Exposure value (IRB)**	**Sum of long and short position of trading book**	**Value of trading book exposure (internal models)**	**Exposure value (SA)**	**Exposure value (IRB)**	**Of which: General credit exposures**	**Of which: Trading book exposures**	**Of which: Securitisation exposures**	**Total**	**Own funds requirements weights**	**Countercyclical capital buffer rate**
Germany	9,878	166,175	0	1,146	242	10,520	4,569	8	118	4,862	0.514	0.000
Poland	3,427	18,271	0	0	0	0	956	0	0	1,010	0.107	0.000
Great Britain / Nothern Ireland	3,658	12,263	0	379	328	936	716	18	21	756	0.080	0.000
USA	1,140	10,391	0	166	4,319	879	484	11	82	578	0.061	0.000
France	177	5,999	0	331	9	242	268	18	3	289	0.031	0.000
Netherlands	42	4,260	0	205	198	30	179	19	8	206	0.022	0.000
Italy	249	2,052	0	80	47	2	144	14	5	162	0.017	0.000
Switzer-land	71	4,573	0	17	0	0	147	3	0	150	0.016	0.000
Greece	0	1,505	0	0	0	0	143	0	0	143	0.015	0.000
Luxembourg	239	4,732	0	21	0	30	131	4	1	136	0.014	0.000
Isle of Man	0	530	0	0	0	0	104	0	0	104	0.011	0.000
Spain	100	1,743	0	37	72	0	89	2	4	96	0.010	0.000
Austria	41	1,878	0	8	0	83	84	0	1	85	0.009	0.000
Belgium	61	1,606	0	50	0	0	67	3	0	70	0.007	0.000
China	0	2,230	0	24	0	0	69	0	0	69	0.007	0.000
Ireland	142	1,492	0	4	7	0	63	1	1	65	0.007	0.000
Czech Republic	324	831	0	0	0	0	55	0	0	55	0.006	0.000
Portugal	25	1,022	0	2	24	0	52	0	1	54	0.006	0.000
Cayman Islands	300	410	0	250	0	0	52	0	0	52	0.006	0.000
Sweden	50	1,244	0	77	0	0	46	2	0	48	0.005	0.015
Turkey	6	733	0	3	0	0	46	1	0	47	0.005	0.000
Singapore	0	1,177	0	0	0	0	46	0	0	46	0.005	0.000
Cyprus	0	477	0	0	0	0	40	0	0	40	0.004	0.000
Russian Federation	23	789	0	2	0	0	39	1	0	40	0.004	0.000
Hungary	25	802	0	3	0	0	33	0	0	33	0.004	0.000
Denmark	2	629	0	27	0	0	28	2	0	30	0.003	0.000
Slovakia	95	293	0	0	0	0	21	0	0	21	0.002	0.000
Jersey	39	345	0	0	0	0	19	0	0	19	0.002	0.000
Finland	0	479	0	12	0	0	18	0	0	19	0.002	0.000
Canada	3	415	0	4	0	0	18	0	0	19	0.002	0.000
Rep. of Iceland	8	227	0	0	0	0	18	0	0	18	0.002	0.000
Hong Kong	0	524	0	0	0	0	18	0	0	18	0.002	0.006
Norway	0	410	0	24	0	0	16	0	0	17	0.002	0.015
Japan	1	230	0	0	0	0	11	0	0	11	0.001	0.000
Korea (South)	0	396	0	411	0	0	6	3	0	10	0.001	0.000
Quatar	0	66	0	0	0	0	9	0	0	9	0.001	0.000
Bermuda	1	184	0	0	0	0	7	0	0	7	0.001	0.000

Cont. Table 50: Geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer

Countries €m	General credit exposures: Exposure value (SA)	General credit exposures: Exposure value (IRB)	Trading book exposure: Sum of long and short position of trading book	Trading book exposure: Value of trading book exposure (internal models)	Securitisation exposure: Exposure value (SA)	Securitisation exposure: Exposure value (IRB)	Own funds requirements: Of which: General credit exposures	Own funds requirements: Of which: Trading book exposures	Own funds requirements: Of which: Securitisation exposures	Own funds requirements: Total	Own funds requirements weights	Countercyclical capital buffer rate
South Africa	1	173	0	0	0	0	6	0	0	6	0.001	0.000
Taiwan	22	31	0	0	0	0	6	0	0	6	0.001	0.000
Peru	0	77	0	0	0	0	5	0	0	5	0.001	0.000
Panama	0	55	0	0	0	0	4	0	0	4	0.000	0.000
Virgin Islands (brit)	6	180	0	0	0	0	4	0	0	4	0.000	0.000
India	0	84	0	0	0	0	3	0	0	3	0.000	0.000
Brazil	17	31	0	0	0	0	2	1	0	3	0.000	0.000
Australia	0	99	0	1	1	0	3	0	0	3	0.000	0.000
UAE	0	211	0	0	0	0	2	0	0	2	0.000	0.000
Greenland	0	58	0	0	0	0	2	0	0	2	0.000	0.000
Malaysia	2	56	0	0	0	0	2	0	0	2	0.000	0.000
Mexico	0	58	0	2	1	0	2	0	0	2	0.000	0.000
Israel	1	95	0	10	0	0	2	0	0	2	0.000	0.000
Curacao	0	72	0	0	0	0	2	0	0	2	0.000	0.000
Indonesia	0	45	0	0	0	0	2	0	0	2	0.000	0.000
Romania	0	107	0	0	0	0	2	0	0	2	0.000	0.000
Bouvet Islands	13	0	0	0	0	0	2	0	0	2	0.000	0.000
Slovenia	0	25	0	0	0	0	1	0	0	1	0.000	0.000
Cook Islands	0	263	0	0	0	0	1	0	0	1	0.000	0.000
Macau	0	70	0	0	0	0	1	0	0	1	0.000	0.000
Guernsey	0	36	0	0	0	0	1	0	0	1	0.000	0.000
Egypt	0	35	0	0	0	0	1	0	0	1	0.000	0.000
Liechtenstein	0	94	0	0	0	0	1	0	0	1	0.000	0.000
Chile	0	19	0	1	0	0	1	0	0	1	0.000	0.000
New Zealand	0	72	0	0	0	0	1	0	0	1	0.000	0.000
Kazakhstan	0	10	0	0	0	0	1	0	0	1	0.000	0.000
Others	18	390	0	0	0	0	5	0	0	5	0.001	0.000
Total	20,206	253,828	0	3,297	5,247	12,722	8,878	114	244	9,461	1.000	0.000

Table 51: Amount of institution-specific countercyclical capital buffer

€m	31.12.2016
Total risk exposure amount	190,527.12
Institution specific countercyclical buffer rate	0.011%
Institution specific countercyclical buffer requirement	21.82

Table 52: Addition to table 1 (Equity structure): B: Reference to article in EU regulation no. 575/2013

Line	(B) Reference to article in the regulation (EU) Nr. 575/2013
1	26 (1), 27, 28, 29, EBA list 26 (3)
1a	EBA list 26 (3)
1b	EBA list 26 (3)
1c	EBA list 26 (3)
2	26 (1) (c)
3	26 (1)
3a	26 (1) (f)
4	486 (2)
4a	483 (2)
5	84, 479, 480
5a	26 (2)
6	
7	34, 105
8	36 (1) (b), 37, 472 (4)
9	
10	36 (1) (c), 37, 472 (4)
11	33 (a)
12	36 (1) (d), 40, 159, 472 (6)
13	32 (1)
14	33 (b)
15	36 (1) (e), 41, 472 (7)
16	36 (1) (f), 42, 472 (8)
17	36 (1) (g), 44, 472 (9)
18	36 (1) (h), 43, 45, 46, 49 (2) (3), 79, 472 (10)
19	36 (1) (i), 43, 45, 47, 48 (1) (b), 49 (1) to (3), 79, 470, 471 (11)
20	
20a	36 (1) (k)
20b	36 (1) (k) (i), 89 to 91
20c	36 (1) (k) (ii), 243 (1) (b), 244 (1) (b), 258
20d	36 (1) (k) (iii), 379 (3)
21	36 (1) (c), 38, 48 (1) (a), 470, 472 (5)
22	48 (1)
23	36 (1) (i), 48 (1) (b), 470, 472 (11)
24	
25	36 (1) (c), 38, 48 (1) (a), 470, 472 (5)
25a	36 (1) (a), 472 (2)
25b	36 (1) (l)
26	
26a	
26a.1	467
26a.2	468
26b	481
27	36 (1) (j)
28	
29	
30	51, 52
31	
32	
33	486 (3)
33a	486 (3)
34	85, 86, 480
35	486 (3)
36	
37	52 (1) (b), 56 (a), 57, 475 (2)
38	56 (b), 58, 475 (3)
39	56 (c), 59, 60, 79, 475 (4)
40	56 (d), 59, 79, 475 (4)
41	
41a	472, 472 (3)(a), 472 (4), 472 (6), 472 (8) (a), 472 (9), 472 (10) (a), 472 (11) (a)
41a.1	472 (3)(a)
41a.2	472 (4)
41a.3	472 (6)
41a.4	472 (8)(a)
41a.5	472(9)
41a.6	472(10)
41.7	472(11)
41b	477, 477 (3), 477 (4) (a)
41c	467, 468, 481
41c.1	467
41c.2	468
41c.3	481
42	56 (e)
43	
44	
45	
46	62, 63
47	486 (4)
47a	483 (4)
48	87, 87, 480
49	486 (4)
50	62 (c) & (d)
51	
52	63 (b) (i), 66 (a), 67, 477 (2)
53	66 (b), 68, 477 (3)
54	66 (c), 69, 70, 79, 477 (4)
55	66 (d), 69, 79, 477 (4)
56	
56a	472, 472 (3)(a), 472 (4), 472 (6), 472 (8) (a), 472 (9), 472 (10) (a), 472 (11) (a)
56b	475, 475 (2) (a), 475 (3), 475 (4) (a)
56c	467, 468, 481
56c.1	467
56c.2	468
57	
58	

Line	(B) Reference to article in the regulation (EU) Nr. 575/2013
59	
59a	
59a.1	472, 472 (5), 472 (8) (b), 472 (10) (b), 472 (11) (b)
59a.2	472, 475 (2) (b), 475 (2) (c), 475 (4) (b)
59a.3	477, 477 (2) (b), 477 (2) (c), 477 (4) (b)
60	
61	92 (2) (a), 465
62	92 (2) (b), 465
63	92 (2) (c)
64	CRD 128, 129, 130
65	
66	
67	
67a	CRD 131
68	CRD 128
69	
70	
71	

Line	(B) Reference to article in the regulation (EU) Nr. 575/2013
72	36 (1) (h), 45, 46, 472 (10), 56 (c), 59, 60, 475 (4), 66 (c), 69, 70, 477 (4)
73	36 (1) (i), 45, 48, 470, 472 (11)
74	
75	36 (1) (c), 38, 48, 470, 472 (5)
76	62
77	62
78	62
79	62
80	484 (3), 486 (2) & (5)
81	484 (3), 486 (2) & (5)
82	484 (4), 486 (3) & (5)
83	484 (4), 486 (3) & (5)
84	484 (5), 486 (4) & (5)
85	484 (5), 486 (4) & (5)

Table 53: Credit risk parameters by geographical location (incl. default portfolio, i.e. for default positions PD = 1)

	in %	Belgium	China	Germany	France	UK	Hongkong	Italy	Japan	Luxembourg	Netherlands	Austria
Central governments or central banks	Ø LGD		36.07	10.54			59.04		20.00			
	Ø PD		0.17	0.04			0.05		0.22			
Institutions	Ø LGD	37.10	46.38	39.50	42.18	57.30	55.27	43.60	44.95	40.34	50.78	25.57
	Ø PD	0.06	0.68	0.14	0.14	1.10	0.18	0.96	0.08	0.10	0.10	0.38
Corporates	Ø LGD	43.25	36.60	35.90	40.77	42.91	35.43	44.28	40.97	33.27	40.33	41.36
	Ø PD	0.44	0.49	5.88	2.86	1.21	4.23	4.08	0.93	7.98	3.49	0.75
thereof specialised lending	Ø LGD	47.53	41.14	33.65	33.84	35.77	38.86	46.52		55.02	37.58	25.66
	Ø PD	0.70	0.85	16.13	17.62	4.15	3.19	11.11		38.93	11.91	8.25
thereof SMEs	Ø LGD		43.78	31.37	42.92	53.83	43.77	59.29		65.79	43.86	40.87
	Ø PD		0.10	6.22	0.20	2.45	0.40	0.50		0.37	0.62	0.27
Retail	Ø LGD	22.23	28.95	23.99	20.77	18.21	24.09	20.19	32.60	21.29	23.13	27.22
	Ø PD	1.50	1.00	1.52	0.97	1.28	0.66	0.37	8.26	2.56	2.04	2.18
Secured by mortg. on immov. property, SMEs	Ø LGD			10.62						2.50	23.04	
	Ø PD			1.38						0.19	0.66	
Sec. by mortg.on immov. property, excl. SMEs	Ø LGD	12.53	10.89	13.54	12.45	11.77	8.94	10.16	12.19	13.32	14.21	12.42
	Ø PD	1.91	0.18	0.96	1.27	0.42	0.55	0.31	5.26	3.38	0.59	0.76
Qualifying revolving	Ø LGD	59.62	57.32	59.52	59.48	59.16	58.21	59.58	59.86	58.61	59.67	58.80
	Ø PD	0.92	0.14	0.40	0.29	0.92	0.10	0.26	0.20	0.30	0.95	1.11
Other, SMEs	Ø LGD	40.82	41.92	37.07	43.12	39.09	38.98	33.09	45.08	28.37	39.92	22.11
	Ø PD	0.81	3.73	4.50	0.70	3.04	1.17	0.90	15.37	0.50	12.04	2.01
Other, excluding SMEs	Ø LGD	34.31	40.20	35.89	20.09	26.43	45.51	18.87	33.23	40.41	33.25	35.87
	Ø PD	0.50	0.44	2.50	0.78	3.59	0.31	0.33	1.80	1.30	1.60	3.44
Total	**Ø LGD**	**41.26**	**39.43**	**29.38**	**40.89**	**47.52**	**41.91**	**43.75**	**22.18**	**34.20**	**42.23**	**33.80**
	Ø PD	**0.36**	**0.52**	**3.24**	**2.23**	**1.17**	**2.88**	**2.65**	**0.23**	**6.86**	**2.77**	**0.63**

Cont. Table 53: Credit risk parameters by geographical location (incl. default portfolio, i.e. for default positions PD = 1)

	in %	Poland	Russia	Switzerland	Singapore	Slovakia	Spain	Czech Republic	Hungary	Unit. Arab Emirates	USA
Central governments or central banks	Ø LGD	100.00	100.00	10.00	22.49		45.00	100.00	100.00	99.92	10.00
	Ø PD	0.13	0.81	0.02	0.03		1.56	0.05	0.24	0.15	
Institutions	Ø LGD	37.13	38.30	27.71	52.96	46.81	13.55	40.69	40.49	54.06	30.10
	Ø PD	0.28	2.78	0.07	0.10	0.19	0.41	0.17	3.77	0.28	0.75
Corporates	Ø LGD	40.87	41.96	39.26	38.71	39.90	40.38	36.79	47.71	18.34	41.68
	Ø PD	5.11	8.99	0.37	2.42	0.91	6.42	5.27	0.62	0.57	3.63
thereof specialised lending	Ø LGD	28.30	42.83	21.19	33.71	41.58	42.53	35.67	89.85	42.52	51.69
	Ø PD	10.87	0.13	0.52	13.85	0.96	4.01	2.48	1.17	0.11	1.77
thereof SMEs	Ø LGD	43.89	64.87	33.16	44.07	19.27	57.68	56.31	43.78		43.33
	Ø PD	5.89	93.47	0.56	0.58	0.58	29.53	48.24	1.60		1.61
Retail	Ø LGD	35.60	17.01	22.51	22.81	33.16	24.33	31.48	33.09	23.22	22.95
	Ø PD	6.59	0.50	1.05	0.28	14.38	0.85	3.11	2.78	0.96	1.10
Secured by mortg. on immov. property, SMEs	Ø LGD	33.01		2.50				21.38			
	Ø PD	10.56		0.40				0.82			
Sec. by mortg.on immov. property, excl. SMEs	Ø LGD	29.45	11.41	15.76	12.96	22.11	11.35	10.79	9.63	11.85	13.29
	Ø PD	5.13	0.40	0.84	0.20	49.37	0.55	2.54	5.54	0.37	1.03
Qualifying revolving	Ø LGD	60.15	59.03	59.00	57.74	61.82	59.80	60.51	59.82	56.78	59.67
	Ø PD	0.60	0.33	0.65	0.20	0.84	0.20	0.48	0.17	0.28	0.29
Other, SMEs	Ø LGD	36.28	43.60	41.31	43.51	35.04	42.88	30.54	43.90		34.63
	Ø PD	8.89	2.55	1.40	0.57	2.56	2.13	3.50	0.25		0.97
Other, excluding SMEs	Ø LGD	51.63	24.74	28.21	31.94	51.64	24.37	41.65	48.15	34.06	30.45
	Ø PD	7.93	0.67	1.39	0.30	4.53	1.31	3.37	3.94	1.70	1.53
Total	**Ø LGD**	**37.72**	**42.79**	**26.54**	**36.97**	**39.83**	**26.18**	**39.49**	**53.91**	**49.15**	**34.94**
	Ø PD	**5.88**	**5.09**	**0.21**	**1.73**	**1.06**	**3.22**	**4.94**	**0.66**	**0.37**	**2.47**

Table 54: Average assessment basis in the period under review by asset class

Asset class I €m	31.03.2016	30.06.2016	30.09.2016	31.12.2016	Average 2016
SACR					
Central governments or central banks	38,864	38,077	52,775	48,653	44,592
Regional or local authorities	27,968	27,710	27,647	25,860	27,297
Public-sector bodies	11,688	12,094	11,555	10,605	11,486
Multilateral development banks	281	361	376	354	343
International organisations	462	502	476	345	447
Institutions	8,193	4,925	4,563	5,791	5,868
Corporates	15,941	10,948	10,190	9,952	11,758
thereof SMEs	958	778	745	762	811
Retail	5,331	5,161	5,244	5,235	5,243
thereof SMEs	91	43	33	131	75
Secured by mortgage on immovable property	1,741	1,332	1,476	1,490	1,510
thereof SMEs	9	8	21	40	19
Defaulted positions	712	355	409	564	510
Particularly high risk positions	37	37	35	35	36
Covered debt instruments	94	97	94	100	96
Investment funds	746	808	786	755	774
Other items	2,723	2,831	2,828	2,821	2,801
Total SACR	**114,782**	**105,240**	**118,454**	**112,561**	**112,759**
IRBA					
Central governments or central banks	23,412	23,778	12,392	22,170	20,438
Institutions	58,953	55,355	58,119	56,561	57,247
Corporates	208,532	212,959	210,668	214,161	211,580
thereof specialised lending	32,618	31,959	30,881	29,723	31,295
thereof SMEs	15,168	15,249	15,508	14,970	15,224
Retail	110,677	112,377	114,097	116,988	113,535
Secured by mortgage on immovable property	67,813	68,075	69,281	65,669	67,709
thereof SMEs	1,012	999	1,004	1,142	1,039
Qualifying revolving	12,375	12,500	12,598	12,682	12,539
Others	30,490	31,803	32,218	38,636	33,287
thereof SMEs	12,879	13,061	13,203	13,111	13,064
Other loan-independent assets	2,010	2,177	5,814	1,927	2,982
Total IRBA	**403,584**	**406,647**	**401,089**	**411,806**	**405,781**
Total	**518,366**	**511,886**	**519,543**	**524,367**	**518,541**

Risk reporting overview

The risk reporting structure as at 31 December 2016 as implemented in the Annual Report, the Disclosure Report and further publications is illustrated in the following table:

Table 55: Risk reporting overview

Topic	Detail	Disclosure report Page	Annual Report Page	Further publications
Equity capital	Capital structure	5–12	248	
	Equity instruments		213–214	Commerzbank homepage
	Capital requirements and leverage ratio	12–15	246–252	
Risk-oriented overall bank management	Risk statement	16–17		
	Risk management organisation	17	94–95	
	Risk strategy and risk management	17–19	95–96	
	Risk parameters		96–97	
	Risk-bearing capacity and stress testing	20–21	97–98	
	Regulatory environment		98–99	
Default risk	Strategy and organisation	22	100	
	Risk management	23–24	100–104	
	Credit risk model	25–32		
	Rating architecture	25–28	103	
	Quantitative information on default risks	32–46	104–111	
	Analysis by segment		106–108	
	Analysis by regulatory approach (IRBA/SACR)	32–43		
	Default risks from derivative positions	44–46		
	Loan loss provisions for default risks	46–50	105–108	
	Investments in the banking book	51–52	187–190	
	Securitisations	53–61	107, 110–111, 265–268	
Market risk	Strategy and organisation	62	112	
	Risk management	62–63	112–113	
	Market risk model	63–65		
	Quantitative information on market risks	65–66	113–115	
	Interest rate risk in the banking book	66–67	114–115	
	Market liquidity risk	66	115	
Liquidity risk	Strategy and organisation	67	115	
	Risk management	68	115–116	
	Quantification and stress testing		116	
	Liquidity risk model	68–70	116	
	Encumbrance of assets		314–315	
Operational risk	Strategy and organisation	70	118	
	Risk management	70	118–119	
	OpRisk model	71		
Other	Legal risk		119–121	
	Compliance risk		121	
	Reputational risk		121–122	
	IT risk		122–123	
	Human resources risk		123	
	Business strategy risk		123	
	Model risk		124	
	Corporate governance report		21–25	Commerzbank homepage
	Remuneration		26–40	Commerzbank homepage
	Indicators of systemic importance			Commerzbank homepage

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List of abbreviations

ABCP	Asset-backed Commercial Paper
ABS	Asset-backed Securities
ACR	Asset & Capital Recovery
AfS	Available for Sale
ALCO	Asset Liability Committee
AMA	Advanced Measurement Approach
AUC	Area under the curve
BaFin	Federal Financial Supervisory Authority
BEC	Business Environment and Control System
CC	Corporate Clients
CCF	Credit Conversion Factor
CEO	Chief Executive Officer
CFCB	Commerzbank Finance & Covered Bond S.A.
CFO	Chief Financial Officer
CMBS	Commercial Mortgage-backed Securities
COO	Chief Operating Officer
COREP	Common solvency ratio reporting
CP	Commercial Paper
CRD	Capital Requirements Directive
CRM	Credit Risk Mitigation
CRO	Chief Risk Officer
CRR	Capital Requirements Regulation
CVA	Credit Valuation Adjustment
CVaR	Credit Value at Risk
EaD	Exposure at Default
EBA	European Banking Authority
ECB	European Central Bank
EEPK	Erste Europäische Pfandbrief- und Kommunal-kreditbank AG in Luxemburg, Luxemburg
EL	Expected Loss
ErC	Economically required Capital
FINREP	Financial reporting
GLLP	General Loan Loss Provisions
G-SII	Global Systemically Important Institution
HGB	German Commercial Code
IAA	Internal Assessment Approach
IAS	International Accounting Standards
ICAAP	Internal Capital Adequacy Assessment Process
ICS	Internal control system
IFRS	International Financial Reporting Standards
IMM	Internal model method
IPV	Independent Price Verification
IRBA	Internal Ratings Based Approach
IRC	Incremental Risk Charge
ISDA	International Swaps and Derivatives Association
ISIN	International Securities Identification Number
ITS	Implementing Technical Standards
KRI	Key Risk Indicators
KWG	German Banking Act
LaD	Loss at Default
LaR	Loans and Receivables
LCR	Liquidity Coverage Ratio
LGD	Loss Given Default
LIP	Loss Identification Period
LTA	Look-through Approach
MaRisk	Minimum Requirements for Risk Management
NBFI	Non-Bank Financial Institution
NI	Non-impaired
OpRisk	Operational Risk
ORX	Operational Riskdata eXchange Association, Zurich
O-SII	Other Systemically Important Institution
P&L	Profit & Loss
PD	Probability of Default
PI	Portfolio Impaired
PSBC	Private and Small Business Customers
RBA	Ratings Based Approach
RBC ratio	Risk-bearing capacity ratio
RMBS	Residential Mortgage-backed Securities
RTS	Regulatory Technical Standards
RW	Risk weight
RWA	Risk-weighted Assets
SACR	Standardised Approach to Credit Risk
SCRA	Specific Credit Risk Adjustment
SFA	Supervisory Formula Approach
SLLP	Specific Loan Loss Provisions
SMEs	Small and medium-sized enterprises
SolvV	German Solvency Regulation
SPV	Special Purpose Vehicles
SREP	Supervisory Review and Evaluation Process
TLA	Top Level Adjustment
VaR	Value at Risk

Disclaimer

Commerzbank's internal risk measurement methods and models which form the basis for the calculation of the figures shown in this report are state-of-the-art and are based on banking sector practice. The risk models produce results appropriate to the management of the Bank. The measurement approaches are regularly reviewed by risk control and internal audit, external auditors and the German supervisory authorities. Despite being carefully developed and regularly monitored, models cannot cover all the influencing factors that have an impact in reality or illustrate their complex behaviour and interactions. These limits to risk modelling apply particularly in extreme situations. Supplementary stress tests and scenario analyses can only show examples of the risks to which a portfolio may be exposed in extreme market situations. However, stress testing all imaginable scenarios is not feasible. Stress tests cannot offer a final estimate of the maximum loss should an extreme event occur.

The interpretations with regard to CRR/CRD IV rules are still ongoing. For example, some of the related binding Technical Standards are not yet available in their final version. Against this background we will continue to refine our methods and models in line with the interpretation of the rules. Thus, our measures may not be comparable with previously published measures and our competitors' measures published may differ from ours.

This report contains forward-looking statements on Commerzbank's business and earnings performance, which are based upon our current plans, estimates, forecasts and expectations. The statements entail risks and uncertainties, as there is a variety of factors which influence our business and to a great extent lie beyond our sphere of influence. Above all, these include the economic situation, the state of the financial markets worldwide and possible loan defaults. Actual results and developments may, therefore, diverge considerably from our current assumptions, which, for this reason, are valid only at the time of publication. We undertake no obligation to revise our forward-looking statements in the light of either new information or unexpected events.

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